



Celebrating 20 years of Storm Drain Detectives

Editor's note: Established in 2000, the Storm Drain Detectives are a group of teachers, students, community members and City of Lodi, Public Works staff who monitor Lodi Lake and the Mokolumne River monthly at several different sites where stormwater enters the river. As the program celebrates 20 years, students reflect on what they've learned and what Storm Drain Detectives means to them.

Our water is important!

By Jasmine Mayo
LODI HIGH SCHOOL

Have you ever wondered how runoff from the streets affects the Mokolumne River? Well that's where Storm Drain Detectives come in. SDD is a program that has been sponsored by the City of Lodi for 20 years, helping students learn how the runoff affects the river.

Every two weeks, Storm Drain Detectives meet at the Discovery Center at Lodi Lake to test the Mokolumne River and Lodi Lake at five different sites, conducting six different water quality tests. The students first calibrate their equipment, then form teams of six. Then each team goes to one of the five sites.

Once at the site, students grab a bucket of water, then begin the testing. Mokolumne River water is tested for dissolved oxygen, water temperature, electrical conductivity, pH, turbidity, and nitrates. We also make visual observations around the site, looking for trash, recording the weather, and noticing anything that can change water quality.

Dissolved oxygen is the amount of oxygen in the water, which is important because organisms need oxygen to live. The data is collected by a CheMet kit and a D.O. meter, which dangles in the water for data. Temperature is measured by the D.O. meter and a thermometer probe. An electrical conductivity, or E.C., probe measures the salt in the water. We measure pH with two pieces of equipment, a pH strip and a probe, which helps us learn how

PLEASE SEE MAYO, PAGE 4



Anna Weigel, an AP Environmental Science student at Lodi High School, wanted to celebrate the 20th anniversary of the Storm Drain Detectives program. So she came up with a sweet idea: a birthday cake. After she took photos of the cake, she and her family took the celebration a step further and ate their fill of the sugary treat.

COURTESY PHOTOGRAPHS

Tokay High students help local ecosystem by raising salmon

Classroom aquarium gives inside look at salmon's life cycle

By Kali Anema
TOKAY HIGH SCHOOL

At first glance, the rectangular glass box sitting in my environmental science class at Tokay High School seemed to hold little significance. However, students soon discovered that it held an essential role in securing the future of our local ecosystem.

The aquarium, lined with fine gravel and equipped with chillers to keep the water at a cool 55 degrees fahrenheit, annually serves as a temporary home for 40 salmon eggs.

In January, after the eggs were reared by the Mokolumne Fish hatchery for 30 days, students excitedly received a first-hand glimpse of this federally protected species. Looking through the walls of the tank, my classmates and I eagerly watched the eggs hatch into plump, bottom dwelling alevins. Under the direction of our teacher, Sandra Starr, we calculated the date of their hatching based on the temperature of the water, and became familiar with the life cycle of a salmon.

Throughout the development of the salmon fry, we not only learned about the shockingly low survival rate of young salmon, but also their irreplaceable role in California ecosystem. In fact, for every 5,000 salmon hatched in the wild, only 5 will survive the journey out to the ocean and return to their hatching grounds to reproduce. Known as a keystone species, these fish provide essential sustenance for carnivores, keep soils rich with nutrients, and support thousands of jobs and local economies.

After approximately 2 months, the alevins developed into fast swimming fry, seemingly eager to be released into their natural habitat. Buses full of high schoolers departed to the Mokolumne Fish Hatchery to bid farewell to the temporary classroom residents. After witnessing the fry begin to explore the Mokolumne River for the first time, I think we could all agree that this salmon project was so much better than simply reading about it in a textbook.

Thanks to this experience, I hope that others will realize the unique opportunity Lodi residents have to see this iconic species in the surrounding local rivers. Due to constant destruction of their habitats, salmon need our help, and with the protection of salmon we in turn help our forests, rivers, food security, and economies.

"Known as a keystone species, these fish provide essential sustenance for carnivores, keep soils rich with nutrients, and support thousands of jobs and local economies."

Heritage students get to test the waters at San Joaquin River

By Dylan O'Ryan
SAN JOAQUIN DELTA COLLEGE

On a blustery day in October of last year, Heritage fifth grade Storm Drain Detective students; Janine Jacinto, their teacher; Kristine Stepping, the Program Manager for Outdoor Education for the San Joaquin County Office of Education (SJCOE); and myself, a Storm Drain Detectives leader who has been a part of SDD for about four years, set out to test water quality at Durham Ferry.

We all met at the Durham Ferry Outdoor Education Center, which is a "center for STEM and environmental exploration, owned and operated by SJCOE," as stated on the SJCOE website. We set off on a 0.75-mile hike to a part of the San Joaquin River, which

eventually flows into the Pacific Ocean by way of the Delta.

A select few of Jacinto's fifth-grade class usually tests at Lodi Lake, which is part of the Lower Mokolumne River Watershed. However, the students were able to test at a new river system at Durham Ferry. This unique experience showed the students that more water sources are essential to test for water quality.

An important distinction between the Lower Mokolumne River Watershed and San Joaquin River is that they have different stream bed sizes. The San Joaquin River near Durham Ferry has a significantly wider stream bed, which can contribute to lower water levels, as noted on our testing day. This distinction created some issues in testing,



where we were unable to test Dissolved Oxygen (DO) using the meter at Durham Ferry due to the shallowness.

It is important to note that both river systems' water quality is graded by the same scale, which is published by the San Joaquin Basin Plan; therefore, we can compare values of water quality as a distinction from the water sources.

The water quality parameters tested at both locations were similar in data we would expect; however, Electrical

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EBMUD biologists share fins and outs of the job with students

By Leonardo Salazar, Max Hernandez, Yaneisy Roman Ortiz, Eduardo Lopez, Paul Roman Ortiz and Jaylene Guerrero
HERITAGE ELEMENTARY SCHOOL

Students at Heritage Elementary School used Zoom, a distance learning software, to interview Ed Ribble and Alan Webster, biologists who work for the East Bay Municipal Utility District.

Q: How is COVID-19 affecting the wildlife?

Ed: COVID-19 is actually having the opposite effect on wildlife compared to the effect on humans. There is less pressure from people on the wildlife, and more room for the wildlife to roam.

Q: How has COVID-19 affected how you do your job?

Ed and Alan: As EBMUD employees we are following their strict protocol, including wearing masks, and working from home when possible.



KATHY GRANT/COURTESY PHOTOGRAPH

A small boat is ready to carry East Bay Municipal Utility District biologists Ed Ribble and Alan Webster to a screwtrap, which captures fish for monitoring.

Q: What is one specific machine that is used to observe the salmon?

Ed: There are cameras on either a fish ladder or a weir to count the returning salmon. Another machine that is used is a rotary screw trap that cap-

tures the salmonids and other fish that are heading downstream.

Q: What is your career or job title?

Alan: Fisheries and wildlife technician.
Ed: Fisheries and wildlife bi-

ologist II.

Q: Where did you attend college?

Ed: Humboldt State.
Alan: UC Davis.

Q: What degree did you receive?

Ed: Fisheries biology.
Alan: Wildlife, fish and conservation biology.

Q: In what way do you work with the watershed and the Mokolumne River?

Ed: We are part of a six-person crew that monitors the salmon run. We also do habitat enhancement projects, such as moving gravel to create reefs.

PLEASE SEE EBMUD, PAGE 4



RIBBLE



WEBSTER



Watershed's birds fly high

Students celebrate the birds who live in the local watershed in art, along with the Sandhill cranes that migrate to the area each winter. **3**



'Toy Story 4' sets a trend

Inspired by the character of Forky and a teacher's challenge, students create their own "quarantine buddies" using recycled items. **5**



Marine science adventure time!

Students share their trips aboard the Marine Science Institute's research vessel in San Francisco Bay. **7**

SALMON IN THE CLASSROOM

Tokay students reflect on Salmon in the Classroom project

TOKAY HIGH SCHOOL

The salmon cycle includes seven stages: egg, alevins, fry, parr, smolt, adult, and kelt. Salmon live in both the Atlantic and Pacific oceans, as well as the Great Lakes and other land-locked lakes. They are born in fresh water, migrate to the ocean, then return to fresh water to reproduce. Salmon are important prey for many species, including critically endangered southern resident orcas, and they are significant to the culture of First Nations and to the economy of the West Coast. Salmon are also indicators of healthy river and marine ecosystem; as habitats degrade and disappear, so do salmon, and as salmon disappear, the

quality of the ecosystem decreases as well, since salmon are an important source of nutrients. And also I learned that different temperatures can show you how fast they will hatch.
— *Jesus Bobadilla*

I learned that when the fish are at the hatchery they keep the fish separated by sizes, like really tiny ones and medium ones and the large ones. The salmon fit into our biology topic because it showed how they started from one cell into a salmon fish. It did help me better understand it because it helped me see how they were developing, like when they were hatched already and they still had the yoke.
— *Elisa Gonzalez*

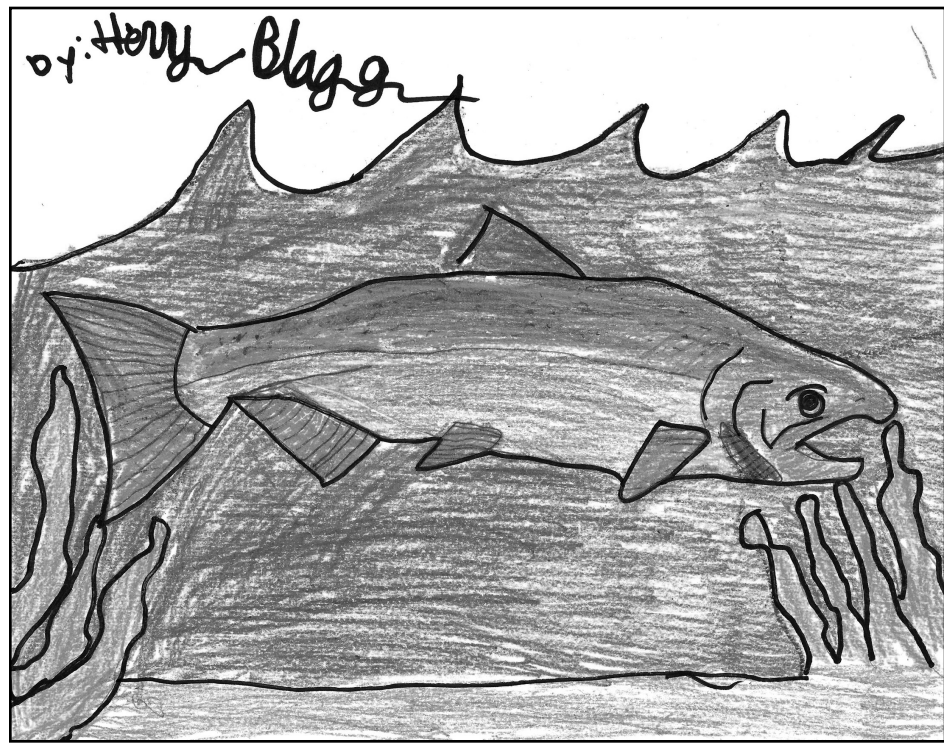
I learned that the life cycle of a salmon is not weird, but not what people think of it as. Like a mother of a salmon can have 5,000 eggs and only five of her eggs would live, which I think is honestly crazy. Also, it's crazy that people keep the life cycle going by taking eggs out of a female salmon and squeezing sperm on them. I think it's weird, but it's a way of us keeping their lifecycle going since we took their habitat by creating the dam. The way I think of it, salmon help us learn a lot about mitosis because of the way they start from an egg to a fish. I know you're probably thinking that we can just do that with a chicken egg, but you really can't, because chicken and salmon are different. A

chicken egg is white and covered, but salmon are orange and a little bit clear so you can see how they develop into a little fish. The salmon really helped me understand a little bit more about them and how mitosis works.
— *Alyssa Rivera*

A few things that I have learned about the baby salmon and how they develop in a cycle are that they first start out as a red egg then to alevins, fry, parr, smolt, adult, and kelt. This is the entire cycle of salmon. My teacher, Mrs. Starr, was given lots of baby salmon eggs to grow in her classroom. They grew very quickly, and then we had to release them. On Tuesday, March 3, a large group of kids

from her biology classes all got together to meet on a bus to go on a field trip to the fish hatchery to release the fish.
— *Robert Lydon*

I learned that the salmon start off as eggs then grow to be an adult salmon. Their bodies can learn to live in fresh water and salt water. We learned in class that some salmon are born in the Sacramento River and travel all the way to the ocean into saltwater. The salmon helped me understand how they are born in one place and can travel so many miles in one lifetime. Some fish don't make it back to spawn because they get caught by fishermen and eaten.
— *Jonathan Solis*



HENRY BLAGG/LOCKEFORD SCHOOL

Learning about salmon at Lockeford School

By Henry Blagg
LOCKEFORD SCHOOL

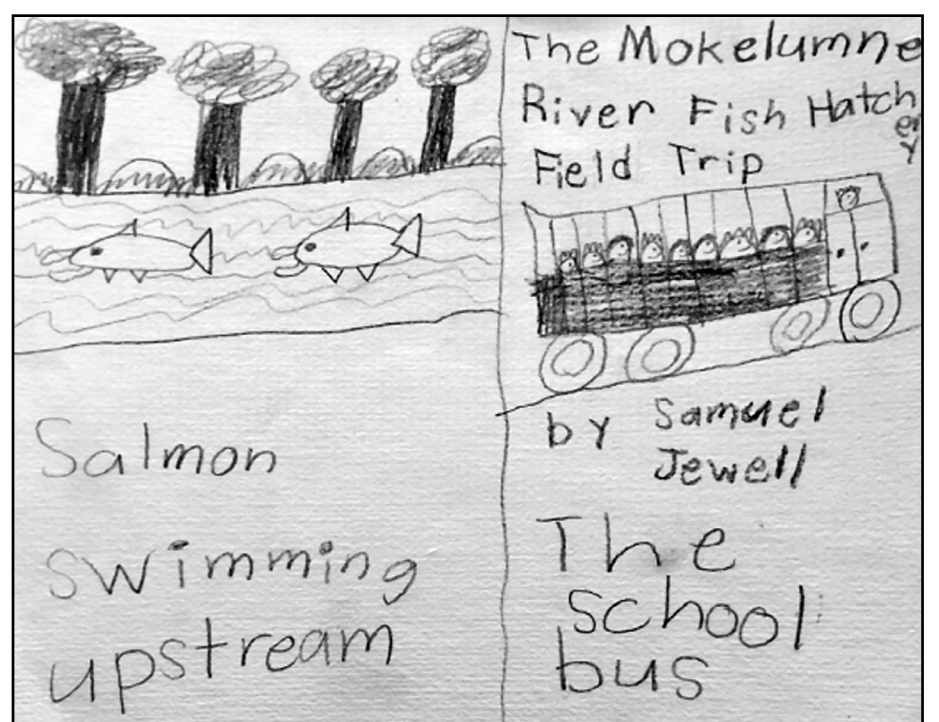
My favorite part of second grade was when we did the salmon project. First, we learned about salmon and the life cycle. Then, we went on a field trip to the hatchery. We saw fish and got to feed them. We also saw the salmon in the river. The people at the hatchery showed us the inside of the salmon and the eggs and milt. After that, they came to deliver our eggs to our classroom. There were 35 eggs. We got to watch them until they hatched. We watched the alevin grow in the fish tank. Then, we took them to the Mokelumne River and released them. I learned a lot about fish.

Fascinating facts about salmon

By Alexander Arreola Garcia
HERITAGE ELEMENTARY SCHOOL

Do you want to learn about salmon? Then here are some awesome facts that you may not have known. Did you know that salmon have teeth in their tongue? Terrifying isn't it? Additionally, salmon have fins that allow them to swim in rivers and in the ocean. The dorsal fin keeps the salmon upright. The other fins are used for steering and

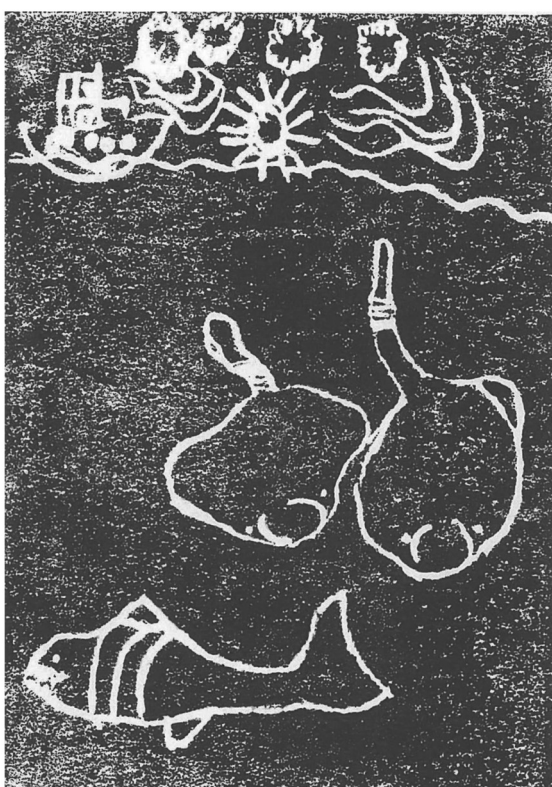
balance. Also, it is not an easy life for salmon. Only about 2% of salmon babies will make it to adulthood. Once salmon are ready to spawn, they return to where they were born. After spawning, the salmon die. If you like eating fish, salmon is a very healthy option. Salmon has protein and many vitamins. If you haven't tried it before, you should!



SAMUEL JEWELL/LOCKEFORD SCHOOL

Alevin Haiku

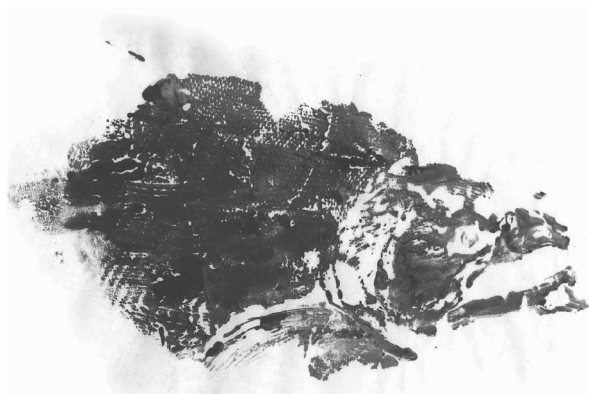
*Swimming in water
With a hanging small yolk sac
These are Alevin*



YAHIR GOMEZ/HERITAGE SCHOOL

Haiku

*Sam the salmon saw
Something bad that made her mad
No, it was people!*



MAX HERNANDEZ/HERITAGE SCHOOL

Cinquain

*Alevin
Small, Weird
Calming, Growing, Hiding
A confused looking animal
Salmon*



ESTEVAN MARTINEZ/HERITAGE SCHOOL

Raising salmon eggs at Heritage Elementary School

By Nafees Khan
HERITAGE ELEMENTARY SCHOOL

At our school this year, one class raised baby salmon. Once they were ready to be released, both fifth-grade classes got to go to the Mokelumne River Fish Hatchery to

release the baby fish into the river. I learned all about the life cycle of a salmon. For example, once salmon are old enough they swim out to the ocean. I also learned that many salmon never make it to the ocean because there are so many predators that want to eat. The

salmon that do not get eaten get very big very fast because they eat a lot of food. It was really fun to release the salmon and learn about their life cycle. My favorite part was watching them splash as they swam away.

The students of Heritage, Elkhorn, Lakewood, Lockeford, Reese and Vinewood elementary schools, Lodi, Millwood and Aspire Benjamin Holt middle schools, Lodi and Tokay high schools, Turner Academy and San Joaquin Delta College would like to thank the following sponsors for their support:



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Season of the Sandhill Crane coming this fall

SPECIAL TO THE MOKELUMNE CURRENT

Art featuring a pair of cranes by Rodrigo Acosta, an eighth-grade student in art teacher Zachery Luchetti's class at Lodi Middle School, has been chosen for the 2020 Season of the Sandhill Crane.

The Season of the Sandhill Crane will shine the spotlight on the ancient, migratory birds that winter in the Lodi area this year.

Normally, this is the mission of the annual Lodi Sandhill Crane Festival, held each November. However, the Lodi Sandhill Crane Association has announced it will not stage the festival this year.

Given the uncertainty surrounding the COVID-19 pandemic, the board decided that planning for a fall festival is impractical.

Though the LSCA has canceled the event, they remain committed to promoting awareness, appreciation and conservation of Sandhill cranes and are implementing alternate methods for sharing their messages.

"While the two-day festival has served as an exciting showcase for the wintering cranes, it has also concentrated considerable activity into a very short period," LSCA President Ken Nieland said. "Limited capacity puts pressure on

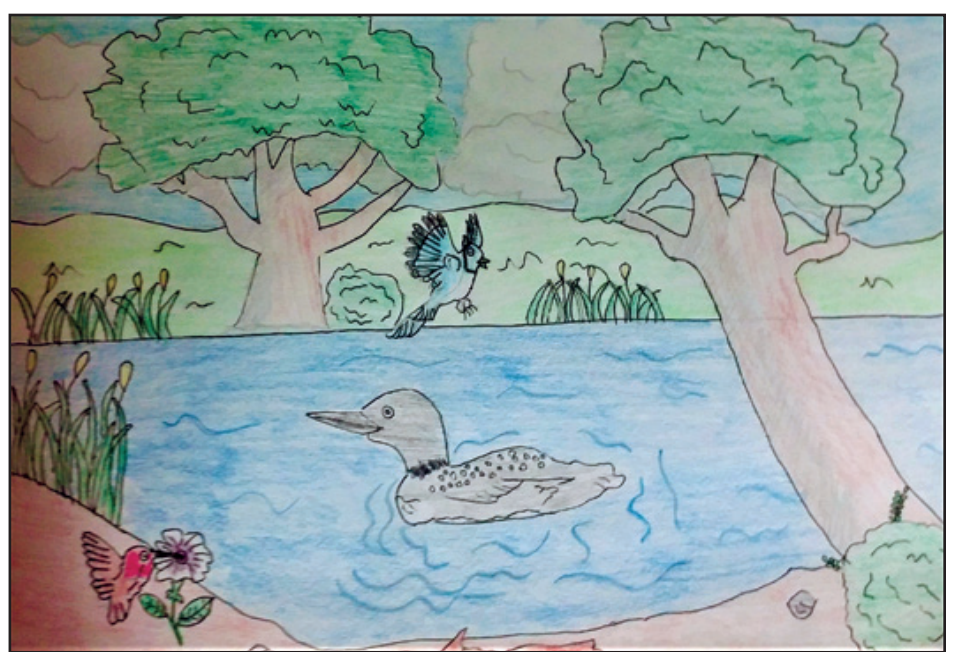
crane viewing sites ... something that could be alleviated by celebrating the cranes throughout the entire five months that they overwinter in the Lodi area."

LSCA leaders are developing new strategies for delivering information from conservation professionals, providing educational resources for students and teachers, encouraging wildlife artists and supporting opportunities for viewing the cranes.

For more information, visit www.cranefestival.org or follow the Lodi Sandhill Crane Festival on Facebook.



CALI RATHBURN/LODI MIDDLE SCHOOL



ANAHI PENAFLOR/LODI MIDDLE SCHOOL



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SHANE SANCHEZ/LODI MIDDLE SCHOOL

STORM DRAIN DETECTIVES

EBMUD

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Q: What interested you to work as a fisheries biologist?

Alan: I've always been a fisherman. I grew up near Vacaville, raised by a single mom who was a teacher and also environmentally conscious. Our school didn't take us on field trips, but my mom always took us out into nature and taught us about the importance of being a good steward.

Ed: I grew up in Stockton, but my family always went up to the Sierra hiking, fishing and camping. Even as a kid I noticed that the Stockton-area waterways were polluted compared to the pristine water in the high country.

Q: What are the most rewarding aspects of your job?

Ed: I love the years with the big salmon runs because you see the results of the work we do with the whole ecosystem.

Alan: For me, it's the salmon run as well, but also it's seeing groups of people coming out for events like Coastal Cleanup to pick up trash and help take care of the environment.

Q: What are the least rewarding?

Alan: As much as I love being out on the river in a



COURTESY PHOTOGRAPH

A screwtrap used to monitor fish populations.

kayak as part of my job, there are times in the winter when it's cold and rainy that I don't love being out there.

Ed: I am not a fan of "bad water" years (when there is little rain, the water level is low, and the water is too warm). I also don't like the pollution that I come across from homeless encampments.

Q: What is your favorite thing about the Mokelumne River?

Ed: My favorite thing about the Mokelumne is the riparian corridor that runs along the river. It's the trees and plants of the riparian corridor that create shade and cool water for the salmonids.

Alan: My favorite thing about the Mokelumne River is the salmon run. For

example, in 2017, almost 30% of the total commercial salmon catch came from the Mokelumne River.

Q: Are there any interesting stories that influenced you to work helping the Earth?

Ed: I grew up backpacking in the Sierra, and went fishing often at the Port.

Alan: I used to fish at Liberty Island, and saw how much trash was in the waterways.

Q: Who are some of your personal heroes, and why?

Alan: My personal hero is my mom. She raised us as a single mom, teaching us about the environment.

Ed: The people who vol-

unteer to take care of the environment, picking up trash.

Q: What activities do you enjoy in your spare time?

Ed: Fishing, hunting, hiking, camping, baseball; any outdoor activities with my kids.

Q: What would you like the people of Lodi to know about the Mokelumne River, salmon, and ways they can protect them?

Alan: I would like people to be conscious of what they put down the drain, and also for them to know that the Mokelumne River contributes more than 20% of the salmon that are in the ocean off the coast of California.

O'RYAN

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Conductivity (EC) was significantly elevated from values we see at Lodi Lake. We recorded a value of 310 uS at Durham Ferry, where on average, we record values of 40 uS around the Lodi area. Electrical Conductivity can be thought of as the amount of salt, or salinity, in the water. Some questions that arise when pondering this elevated value of salinity: is there brackish water or tidal influence on the San Joaquin River? Are draining agricultural fields affecting this value?

These questions would

have to be further researched and studied before making a conclusive decision. However, the Heritage SDD students were left with a question to ponder: how do changes in location affect our water quality, and what impact could we potentially be having on our waterways? This trip, among others, allows for students to make observations that water quality is dynamic and changes with location.

The Storm Drain Detectives program hopes to foster an interest in water-quality related issues and create a stream of future adults who will better our environment, both locally and globally.



COURTESY MAP

The two locations where Heritage students tested water quality with Storm Drain Detectives.

MAYO

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acidic or basic the water is. Nitrates are measured with a different type of test strip, which shows how much nitrogen is in the water. The final test is turbidity, which tells us how clear or muddy the water is. A sample is put into a small bottle, and brought back to the Discovery Center, then put into a machine that measures the turbidity.

Once we are finished gathering data, we give each site a letter grade, comparing SDD data to the San Joaquin River Basin water quality plan, which tells us if the streets' runoff is affecting the Mokelumne River.

We also help in many events like Love Lodi, Coastal Cleanup, and the NorCal Science Festival at Tokay High, working to clean up trash or educate



COURTESY PHOTOGRAPH

Storm Drain Detectives — including Jasmine Mayo, second from right — pose for a photo.

people so that they learn how runoff can cause water pollution.

Each fall, we also go on a boat trip in San Francisco Bay, where we learn

that all rivers in Northern California drain into the bay then into the ocean.

A goal of the SDD program helps people understand how each individual

affects the river, so help us and keep our water clean!

To learn more about the SDD program, go to www.lodi.gov/492/Storm-Drain-Detectives.

Cruz and Luca Martinez on life as junior Storm Drain Detectives

SPECIAL TO THE CURRENT

Editor's note: Cruz and Luca Martinez are the third generation of their family to get involved with the City of Lodi's Storm Drain Detectives program, along with their mother Melanie Martinez and their grandmother Janine Jacinto. The pair — two of the program's youngest volunteers — answered a few questions about Storm Drain Detectives.

Q: How many years have you participated in Storm Drain Detectives?

Cruz: I have been at SDD for 4 or 5 years.

Q: How old are you?

Cruz: I am 8 years old.
Luca: 4.

Q: What do you do as a Storm Drain Detective?

Cruz: I usually sit down and do my homework while the older kids are testing the water.

Q: Who do you participate with?

Cruz: I participate with my mom, my mom's stu-

dents, and my brother, Luca.

Q: What have you learned being a Storm Drain Detective?

Cruz: I have learned that the water that comes from your sprinklers goes down to Lodi Lake. If you hit a baseball and it went down the drain, then it would go to Lodi Lake. It's telling you that, for example, if you put a piece of trash on the sidewalk that the rain might wash it down the storm drain and it would go to Lodi Lake,

and then the animals will think it's something to eat, then they'll eat it and then they'll die.

Q: What message would you like to tell other kids that they can do to help the environment?

Cruz: The message I would like to send to other kids is don't leave trash on the sidewalk.

Luca: Stay home! Because if someone else would get sick then you could get sick. Right now the coronavirus is not stopping!

Learning about how we use the watershed

By **Katelyn Collette**
TOKAY HIGH SCHOOL

Our watershed is comprised of water being delivered from a variety of sources. As the water travels downstream, it is accumulating chemicals, fertilizers, and so many more harmful wastes caught in its path. Our AP Environmental Science class along with students from other schools have been working with the City of Lodi to learn about and monitor the waterflow that travels through our community and into the Mokelumne River.

This program has given each of us the opportunity to work hands-on with the properties of the water and the equipment we use to measure that. This involvement brings light to potentially avoidable man-made issues surrounding the water quality where we learn to measure various sources of water pollution, com-

ponents in the water that can make it difficult for aquatic organisms to survive, and attributes that can disable the water to be potable.

Throughout the process of our work, we are able to learn more about how we affect the environment and visa versa which, in turn, results in the further awareness of how people in the community can do their part to keep the water safe and clean including watching what we put down the drains and keeping the streets clean of harmful things that can wash down the sewer.

It's important to keep the community involved and knowledgeable about the characteristics of their water in order to keep it a healthy place for our swimming and floating members of the community, but also to keep it a functioning part of our society through our need for clean water.

Community buy-in is vital in caring for the watershed

By **Benjamin Gobel**
TOKAY HIGH SCHOOL

It's hardly arguable that the most important resource for human survival is clean, fresh water, yet too often we and our communities ignore our access to this valuable resource as a given right. To promote a more sustainable method of water consumption, the city of Lodi obtains a large percentage of its water from the Mokelumne River, helping to lower the rate at which water is pumped out of our aquifers and thus the rate at which our soil subsides. Unfortunately, however, the river we obtain our drinking water from is the very same one in which a great number of our storm drains run into.

This year I was given the opportunity to participate in the Storm Drain Detectives program, a partnership between teachers, students and Lodi Public Works to help ensure that the quality of our drinking water is kept at an acceptable level for public consumption. Using various tools and methods to collect, sample and test water for pH, nitrate

concentrations, temperature, dissolved oxygen, salinity, turbidity and more has given me a greatly improved understanding of incredibly important real-world processes that we hardly notice due to how smoothly our city keeps them operating.

Seeing and interacting with the place that the water I've been drinking for most of my life comes from has also made me think much more about how much water I consume. When I brush my teeth or wash my hands, I now have seen and understand the maintenance of the exact area my water comes from and try to take greater care in using less water.

Seeing the resource you're depleting in person can have a massive impact on the way you think about resource use in general, as though water may be a sustainable resource in paper, it is only sustainable if the rate at which we use it at regularly is responsible. The more members of our community interact with our local resources, water being the most important of all, the more responsibly we will use them.

How I became a Storm Drain Detective

By **Madalynn Westland**
BENJAMIN HOLT
MIDDLE SCHOOL

The Storm Drain Detective program is an amazing opportunity available to anyone. I am proof that any young person can join, even if your school does not currently participate in the joint City of Lodi Public Works and Lodi Unified School District programs.

From personal experience, I can share that I do not get school credit for my work at the various body of water locations. Most students are involved in SDD as part of their school curriculum and environmental sciences learning opportunities. I attend a charter school that is not currently connected with SDD.

However, when my

mom first learned of SDD and all the cool things they got to do and learn, like calibrating specialized equipment, teamwork, journaling, practicing organizational skills, and especially being on the lake, I knew I wanted to sign up. Learning about nature, pollution and the environment is a passion of mine.

My family made a commitment to the program and I enjoyed all of my time with the staff, teachers, and other students. SDD has allowed me the opportunity to grow in a supervised environment.

I have enjoyed meeting new people and developing new skills. My lifelong goal is to be an environmental engineer. SDD is enabling me to meet my goal. Thank you, SDD.

CELEBRATING PLANET EARTH

EARTH DAY IDEAS: Students weigh ways to care for our planet

Editor's note: Students were asked to journal using these five daily prompts from April 21 to 24, in honor of Earth Day. This year was the 50th anniversary of Earth Day, which has been held every April 22 since 1970.

'We should take care of Earth ... Earth is where we live'

By Alexandra Geronimo
HERITAGE ELEMENTARY

Monday: Why do we need to take care of the Earth?

I think that we should take care of the Earth for many reasons. One reason why I think we should take care of Earth is because Earth is where we live, and if we don't take care of it, then it won't be a good place to live in. Another reason why I think we should take care of Earth is because we are destroying it and that is bad.

This is why I think we should take care of the Earth.

Tuesday: What do you love most about nature?

One thing that I like the most about nature is that nature makes a lot of beautiful sounds, places and much. Another thing I like about nature is that it is very peaceful. This is what I love about nature.

Wednesday: Why is it important to recycle?

I think it is important to recycle because it is good to reuse items to make more items. That way, we won't be making more of the items when we can be reusing other items to make other items.

Thursday: How can you teach people about the environment?

There are many ways to teach people about the environment, but here are a few. One way is to make posters that tell and show about the environment and put them up around different places. Another way, is maybe make a book about the environment and how it's really been changing. These are two ways that you can teach people about the environment.

Friday: What are some ways that you and your family could reduce and reuse?

One way my family can reduce and reuse is save items like plastic bottles, newspapers, etc. and send them to recycling centers. Another way is to use used items around the house and make some items that we would need. These are some ways my family can reuse and reduce.

'Earth has been here far longer than us, even all of humanity'

By Mohammad Ahsan
HERITAGE ELEMENTARY

Monday: Why do we need to take care of the Earth?

We need to take care of Earth and there are many reasons. Here are a few. In my opinion we need to protect the Earth because it is not only our planet, but so many other living things home too. The Earth has been here far longer than us, even all of humanity. The human race has only been polluting it. Then, for the future years, the drinking water will be bad, the air will be bad to breathe, and plants and other living things that do not have homes like us will die. The Earth will have

gone from a lush green planet, to a place where no one can live. These are a few reasons why we need to take care of Earth.

Tuesday: What do you love most about nature?

Something that I love about nature is that it is so beautiful. It is full of magic and wonders, and it has kept people curious.

Wednesday: Why is it important to recycle?

Here are some reasons why it is important to recycle. It is important to recycle because if we do not we will eventually run out of resources. With recycling we can reuse and keep the cycle going. Also recycling keeps the world clean. The Earth is our planet and it is the only one we get so we need to take care of it.

Thursday: How can you teach people about the environment?

Here is one way that you can teach someone about the environment. If they like animals you can talk to them about how you need to take care of the environment, or the animals will not have a home. Then, they will take care of the environment and protect the animals they care about. This is one way you can teach someone about the environment.

Friday: What are some ways that you and your family could reduce and reuse?

There are many ways that we could reduce and reuse. For example, if we were to have bought something that came with cardboard, we could have been creative and made a model of a house or something. This is only one of many ways you could reduce and reuse.

'Your trash could end up anywhere in the world'

By Yahir Gomez Gonzalez
HERITAGE ELEMENTARY

Monday: Why do we need to take care of the Earth?

We need to take care of the Earth because it is the only planet that we can live on. We also need to take care of the Earth because if we don't then some animals can die or go extinct. For example, if we litter, animals might mistake it for food and eat it and that can sometimes kill them or harm them. These are some reasons why we need to take care of the Earth.

Tuesday: What do you love most about nature?

What I love most about nature is that you can go out and explore. For example, if you go camping you can explore and see if there are animals out there.

What I also love most about nature is that you can go hiking. And, at the end, you can see how far you have gone. This is what I love about nature the most.

Wednesday: Why is it important to recycle?

It is important to recycle because if you don't, then your trash could end up anywhere in the world. For example, it could end up on a beach, and the beach would eventually be covered in trash. It could even end up in lakes, rivers, and in an ocean. If it does end up in an ocean, river or lake, then it could harm wildlife. These are some reasons why I think we

Kids make new friends while social distancing

Inspired by "Toy Story 4" and the beloved new character Forky, Heritage Elementary School teacher Janine Jacinto challenged students to make new friends while social distancing during the COVID-19 pandemic — literally. Here are their new friends, made from recyclable materials and trash.



Max Hernandez-Velasquez of Heritage School with his hammerhead shark pal Hammer.



Yaneisy Roman Ortiz of Heritage Elementary School holds her homemade friend Kathy.



So much fun she didn't stop at one: Jaylene Guerrero of Heritage Elementary School with Jack and Jill.



Cruz Martinez of Reese Elementary holds his new friend, Cruz Jr., made of cardboard tubes and corks.

should recycle.

Thursday: How can you teach people about the environment?

Some ways I could teach people about the environment is by telling them that smoke pollutes the environment and that sometimes it might harm animals. You could also tell them that trash could end up in the ocean and harm fish or the ecosystem. You could tell them that trash pollutes the air and makes it unhealthy for people, animals, and plants. These are some ways you can teach people about the environment.

Friday: What are some ways that you and your family could reduce and reuse?

Some ways my family could reduce and reuse is by throwing plastic things into a recycling bin. Another way that my family could reduce and reuse is if we don't litter. And we could reduce and reuse by not using the car so it doesn't pollute the air. These are some ways that my family could reduce and reuse.

'It is important to recycle ... supplies on Earth are scarce'

By Eduardo Lopez Coyazo
HERITAGE ELEMENTARY

Monday: Why do we need to take care of the Earth?

I think we need to take care of Earth because we live on it, and so far it is the only planet that has breathable air and has water.

Tuesday: What do you love most about nature?

What I love most about nature is trees because they provide oxygen for people and for the liv-

ing things on Earth.

Wednesday: Why is it important to recycle?

It is important to recycle because supplies on Earth are scarce and we can reuse the supplies we have to save supplies for future generations.

Thursday: How can you teach people about the environment?

You can tell people that plastic is very harmful to the environment because many animals mistake it for food.

Friday: What are some ways that you and your family could reduce and reuse?

These are ways to reuse paper. One way we could reuse paper is if one side is full you turn the page and start writing there.

'The thing I love most is the sound of nature'

By Leonardo Salazar Flores
HERITAGE ELEMENTARY

Monday: Why do we need to take care of the Earth?

It's our only planet viable for us to live on. I think the reason we have to take care of our Earth is because it's the only planet that we can live on. Another reason is because it's a beautiful planet as well. This is why I think we need to take care of Earth.

Tuesday: What do you love most about nature?

I love the pleasing sounds of nature. There are many things I love about nature, but the thing I love the most is the sounds of nature. For example, you're walking through a forest and you hear the birds chirping and the wind making the trees move.

Wednesday: Why is it important to recycle?

It's important to recycle because when we recycle we also reuse items, for example water bottles or anything that uses plastic. While recycling we also reduce the use of other items.

Thursday: How can you teach people about the environment?

I can teach people about the environment by telling them what type of animals there are.

There are many ways on how to teach people about the environment. For example, talking about the environment or the type of trees in that area. I would teach them about what kind of animals are in the area. The reason is because they would then know what kind of animals there are and know their weaknesses, and they know what not to do in the environment and not harm the animals.

Friday: What are some ways that you and your family could reduce and reuse?

Ways that my family and I could reduce and reuse is by using reusable bags. It also helps the environment. My family can also use reusable water bottles. My family is not only reducing and reusing, but also helping the environment.

'All the things we don't recycle will somehow end up in the ocean'

By Nathalie Osorio-Rogel
HERITAGE ELEMENTARY

Monday: Why do we need to take care of the Earth?

We need to take care of Earth for many reasons. One of those reasons is because we should take

care of Earth is because we live on Earth and it is our responsibility to take care of it. We need to care for animals that live on Earth. Some animals are food for some humans. We also need to consider walking more than using cars. My reason for that is because all the smoke that is released when driving, or turning on your engine, stays in the air. And too much smoke in the air can be harmful to humans and animals.

Tuesday: What do you love most about nature?

What I love most about nature is every landscape is different, and has its own unique feature. For example, I really like that some landscapes have flowers that are very pretty. What is really cool is there is different types of rocks in different areas. Some might have crystals, diamonds, gems, or other types of rocks. Each different part of nature is different from the rest, which makes it very exciting, because you will not know what another part of nature has.

Nature also has animals. Animals are very fascinating. Looking at animals that you have never seen is amazing because of what you can observe, and learn from them.

One last thing I love about nature is there is a smell that is different wherever you go in nature, that might or not be pleasant.

Wednesday: Why is it important to recycle?

It is important to recycle, because all the things we don't recycle will somehow end up in the ocean. An estimate of 14 billion pounds of plastic that enter the ocean a year. Why? Because some people don't recycle, and when they don't, and they put plastic in their

PLEASE SEE EARTH, PAGE 6

ALL AND SUNDRY

Pacific lamprey is a little friend near you

By Max Hernandez-Velasquez

HERITAGE ELEMENTARY SCHOOL

Hello. Did you know that there's a native eel in the Mokelumne River? Many residents of Lodi don't even know this, or have even heard of the eel.

For those of you who have never heard about the eel, it is called the Pacific lamprey, and it grows to be 30 inches long. When it's an adult, its diet consists of salmon, flatfish, rockfish and many other marine animals. Their lifespan in the wild is eight years and they are native to North America. The

species name is Petromyzontidae. They latch onto their prey with their needle-like sharp teeth. They have a pair of fins, an anterior dorsal fin, the posterior fin and the caudal fin. Their body also has eyes, a nostril, a buccal tunnel with its teeth, and external gill slits. The adults are a bluish-black, or greenish above and completely pale underneath.

Pacific lamprey spend most of their life as larvae and live in the freshwater environment for several years. After the larvae become juveniles or adults they no longer have jaws and are considered jawless. This gives them the ability to suck on salmon or

other marine animals and feed off of them. They live for one or two years in the ocean and then they will return to freshwater to spawn. Then, when they lay eggs they build a nest, or a redd, in tiny gravel. The female Pacific lamprey can lay up to 100,000 eggs!

In many ways they are like the salmon because they both are euryhaline, which means they can survive in both fresh and saltwater. They are also alike because their life cycles are practically the same. And now you know about a very tiny fella that might live in a river near you!

Visiting the Mokelumne River Fish Hatchery on a field trip

By Samuel Jewell

LOCKEFORD ELEMENTARY

Last fall in 2019, our second-grade class got to go to the Mokelumne River Fish Hatchery. We rode on the school bus with our teacher Mrs. Gilbert and Mr. Rogers, the principal of Lockeford School. We got to see salmon swim upstream and jump up the fish ladder. We also saw the workers through the windows: they were milting the males and taking the eggs out of the females in order to fertilize the eggs. There were MILLIONS of them! Later we got 35 eggs delivered to our classroom. We put them in a fish tank to watch them grow. Then we went back to the river and let them go free.

The grossest part of the field tri was when we got to hold a sac of eggs. They felt so slimy and they were cold. The coolest part was when the tour guide let us go in the deep freezer — you won't believe what we saw!



KATIE MANIES/MILLSWOOD MIDDLE SCHOOL

What are lampreys?

By Emma Starr

VINEWOOD ELEMENTARY SCHOOL

Lampreys are ancient fish that have no jaws! They suck onto everything they can. They stick onto other fish to suck their blood

for food and travel around the ocean. Lampreys are meant to be there because they are native fish. At the Mokelumne River a lamprey sucked onto my hand! It tickled but it didn't hurt. In my opinion lampreys are awesome fish!



COURTESY PHOTOGRAPH

Joey Richle poses for a photo with his giant cabbage plant.

My AgVenture cabbage plant

By Joey Richle

LAKEWOOD ELEMENTARY SCHOOL

My teacher Mrs. Milligan took our third-grade class from Lakewood Elementary

to AgVenture. There we learned that plants grow with water and sunlight. Every day I watered my cabbage. As it grows you can see layers and you can eat the middle.

GET INVOLVED WITH THE MOKELUMNE CURRENT

Every year, classes that participate in the City of Lodi Watershed Program and Storm Drain Detectives put together the Mokelumne Current. To get involved, interested teachers may call program coordinator Kathy Grant at 209-333-6878 or email kgrant@lodi.gov.

To see past editions of the Mokelumne Current, visit lodieei.wordpress.com.

EARTH

CONTINUED FROM PAGE 5

regular trash cans. They will fall out of the garbage trucks and end up in the oceans.

It is also good to recycle because there are animals suffering and dying because people don't take the time that it takes to recycle. For example, whales, turtles, fish and more think that plastic is food so they eat it and plastic is not edible. Others get stuck in nets or plastic. Because we don't recycle, it can affect other living things other than ourselves.

Thursday: How can you teach people about the environment?

There are many ways to teach someone about the environment. One way to teach someone about the environment is to watch a video about the environment. A video could teach a person a lot about the topic of the video.

You can actually teach a person about the environment yourself with the facts you know. Like when you talk about an environment, tell the person what you know, like animals that live there, or flowers, plants or crops that live there, or what the weather is usually like.

Another way you can teach a person about the environment by reading books about your environment. Books help us in many ways. One can be by learning about your environment.

My last way to teach a person about the environment is by actually experiencing what it is to live in that. Those are my ways to teach someone

about the environment.

Friday: What are some ways that you and your family could reduce and reuse?

One way we can reduce is by using less of something. A way of how we can reduce something is all the fruits and vegetables that we get at the store we can grow ourselves. That way we can reduce all the plastic that we get when we buy fruits and vegetables.

Another way I can reduce plastic in my house is to not buy as many plastic water bottles. My family and I have a big reusable gallon of water that almost always contains water. Every time we run out of water in that gallon we refill it.

One way we reuse is when we have leftover food, we store it in empty food buckets. Another way you can reuse is all the plastic bags we get when we go to the store. We reuse them as garbage bags. Gift bags we get we reuse to give gifts to other people. Those are some ways me and my family reuse and reduce.

'Trees are like family because we need them!'

By Yaneisy Roman Ortiz

HERITAGE ELEMENTARY

Monday: Why do we need to take care of the Earth?

Based on what I know, we need to take care of the Earth because without Earth we would not be alive. We need Earth. For example, if we don't take care of the water on Earth we will not survive. We need that water

to drink, plant crops and take showers. Also if we don't take the time to have plentiful soil on Earth, how are we going to grow crops, fruit and everything we eat? Without food we wouldn't be able to survive either.

Without water we can't grow trees! What do we use trees for? A lot of things, for example: paper, houses, pencils, maple syrup, candy wrappers, chewing gum, rubber and sponges. The bark of trees that we grow with water could be used for dyes and medicine, and the leaves and roots create oils that makes cosmetics and medicine.

Tuesday: What do you love most about nature?

What I love most about nature is the trees. It is really interesting to see how long they been alive and investigate how many more years it will live. They are super big and help us with our lives. Even though some people just see trees as not that important, without trees we wouldn't be alive. Trees make lots of things including oxygen, which we need to survive. Trees are like family because we need them! My favorite tree is the oak tree!

Wednesday: Why is it important to recycle?

It's important to recycle because if we don't recycle it could cause pollution. If we recycle it could help the environment from trash. Also, if we recycle that saves energy which reduces gas emissions, which helps to not change the climate.

If we don't recycle the oceans or rivers would be

full of trash. How does not recycling not help us and anything around us? If we don't recycle the rivers or driveways and oceans would be full of trash. That affects us and things around us because if the water is full of trash that will destroy animals home. With that, animals could get extinct.

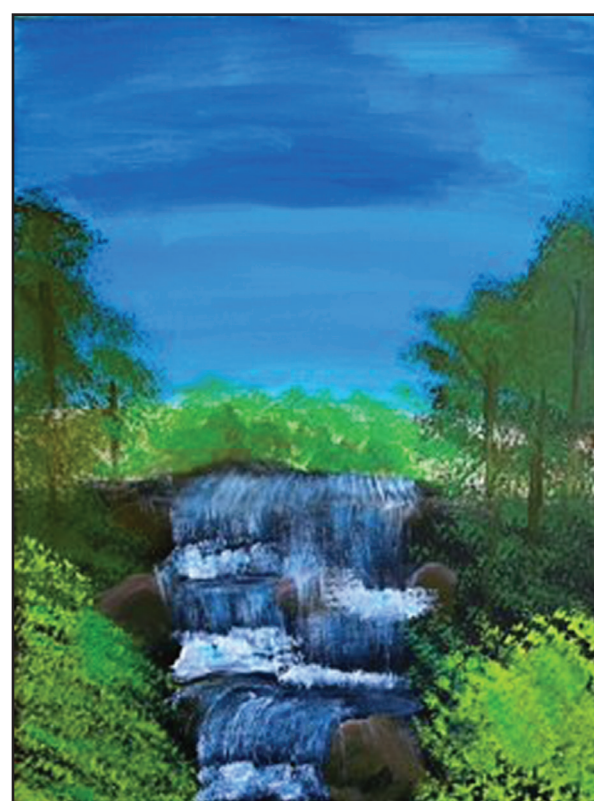
For the driveway, that would affect us because all the trash there is could cause things in the air which would cause pollution which is not good for us.

Thursday: How can you teach people about the environment?

I can teach people about the environment by doing lots of things. One way i could help teach about the environment maybe could be by writing about the environment and how to protect it and the Mokelumne River. Another way i could help teach is by going outside and seeing how clean the environment is. Also, we could join a club that teaches us about the environment. The environment is where we live so it would be interesting if we learned about our environment.

Friday: What are some ways that you and your family could reduce and reuse?

Some ways my family could reduce and reuse is in many ways. For example, instead of using plastic bottles we could use reusable water bottles, so then we don't use as much plastic. When we go shopping it's better to use bags of material than plastic bags. If we reuse and reduce it will help Earth a lot.



JAIDA GAO/ELKHORN SCHOOL

Alevin Haiku

*Alevin, small fish
Camouflaging in the rocks
They hatched from an egg*



YAHIR GOMEZ GONZALEZ/HERITAGE

OCEAN ADVENTURES WITH MSI

Tokay, Lodi High students reflect on Marine Science Institute trip

SPECIAL TO THE CURRENT

In fall, 2019, the City of Lodi Watershed Education Program organized study trips for five Lodi schools. Students were able to attend a Marine Science Institute Discovery Voyage to the San Francisco Bay, and also visited either the Aquarium of the Bay or the Academy of Science in San Francisco, depending on the trip.

Many sponsors helped make these trips possible, including the Lower Mokelumne River Partnership (East Bay Municipal Utility District, U.S. Fish and Wildlife, and California Department of Fish and Wildlife), the C.A. Webster Foundation, Waste Management, and a GoFundMe consortium of private donors.

The students wrote and sent many “thank you” letters. Below are a few excerpts showing the importance of these trips to the students. Thank you, sponsors!

“Hello, this is one of the many students who went on past Wednesday’s amazing field trip! ... I am the kid who wore the T-Rex hat. I wanted to say thank you very much for the experience and the knowledge I was able to gather by going.

... on the boat I think the coolest thing I learned was not even the things that were taught but the things we could experience, hands on. Nothing super important, but things like how the fish felt and what they looked like, where we caught them, how we caught them, all that. While I did lean plenty



COURTESY PHOTOGRAPH

High school students pose for a photo on the dock with the Marine Science Institute's research vessel, the Robert G Brownlee, behind them.

from those aboard the boat, the most intriguing experiences were those that I could take part in myself, not just hear about.

Thank you once again for allowing us to take part in those two wonderful experiences. The ability to get out of a classroom and really focus and study science hands-on is not something anyone really get to do unless it is their profession, a very unique and undervalued opportunity!”

— *Ethan Fulton, Tokay High AP Environmental Science*

“Thank you for your generous donation that allowed my classmates and me to attend a trip with hands on learning. It was amazing to take everything we learned

from Storm Drain Detectors and apply it in a broader sense. We got to see the way our watershed works starting from the Mokelumne River out to San Francisco Bay and the ocean. It was really eye opening to be able to see it all myself, and how everything works rather than from solely in a classroom. Firsthand, we got to test water quality, and examine life forms and see all the ways each one of us is helping or hurting the ecosystem in the Bay, even from hours away. We examined tiny organisms like plankton and saw how they live, the many different types, and their role in the ocean. We also examined the mud, and fish. This trip was eye opening seeing the effect every per-

son has in our California watersheds and even the worlds’ oceans and that we can contribute to helping preserve our watershed and world.”

— *Savanna Berry, Lodi High Biology*

“I learned so much on this breathtaking trip. I learned about plankton and how they are drifters, including some crabs and even microscopic plankton. I learned how to pet a fish from head to tail, not from tail to head — otherwise you will remove the scales. Thank you so much for the experience of a lifetime, catching fish, learning about phytoplankton and realizing how much we need to protect the environment. I wish you would carry on these trips for future

students as it is a great experience that everybody ... needs”.

— *Seth Cunha, Tokay High AP Environmental Science*

“... during the boat rotations, I was surprised to learn the amount of non-native species in the San Francisco Bay. It gets one thinking about the amount of invasive species in environments around us that we don’t even realize are invasive, and are choking out native species. Also, I found several different species of plankton in the bay very interesting as well. I didn’t realize the wide range of species there are in just a small amount of water.”

— *Kali Anema, Tokay High AP Environmental Science*

“Thank you so much for paying for our trip. The entire class learned so much about marine life. Once the class got to San Francisco, we visited the Aquarium of the Bay. We learned about the marine life of the Bay, such as sharks, invertebrates, and fish. After that, we stopped to eat lunch and explored Pier 39. We then got back on the bus and traveled to a dock where we boarded the boat (in Richmond). While on the boat we learned about plankton, hydrology, invertebrates, and ichthyology. My group caught two rays and three fish in the ichthyology station. Because of your sponsorship, we got a day to be immersed in biology.”

— *Maggie Fugate, Lodi High Biology*

All about my trip to the Marine Science Institute

By **Brian Torres**

HERITAGE ELEMENTARY

The day we went on the MSI research vessel, it was cold and windy. The boat shook at the beginning, then it calmed down.

We went to all four study stations. There was a station where we saw plankton. I saw the plankton by first using a contraption to catch them. We used a microscope to see the tiny plankton.

There was also a station where we touched sea creatures, and caught some too. We caught them by tossing a big net into the bay from the back of the boat. One of the creatures that I touched was a stingray. I felt kinda nervous and it felt slimy.

Also, we studied the water at a station called hydrology. We checked temperature and density. We also put mud on our faces from the bottom of the bay, and made a promise to never harm a sea creature.

The best part was that



COURTESY PHOTOGRAPH

Brian Torres and his mother pose for a photo in front of the Robert G. Brownlee research vessel that his class got to sail on during a field trip to the Marine Science Institute.

my mom came with me on the trip. One thing my mom liked about the trip was that she was in the middle of the bay on a boat for her first time, and

she thought it was amazing! Another thing she liked was that she could help the teacher with the kids. One thing my mom

learned on the trip was the temperature and density of the water. My mom liked that there were no problems and everything went well!

California native fish: the hitch

By **Charlie Starr**

LODI HIGH SCHOOL

The hitch is a minnow that is native to some Northern California lakes and streams. One of those streams happens to be the Mokelumne River.

The hitch is usually 2 to 3 inches long, but can grow much larger. When I was out on the Mokelumne River checking screw traps with East Bay MUD, we caught a hitch that was 6 inches long! Along with the one huge hitch, we caught another five smaller 2- to 3-inch hitch.

One fact about the hitch is that they grow at different speeds and to different sizes depending on the body of water they are living in. This may be attributed to different water conditions in different areas.

All in all, hitch are some pretty cool little fish.

Littering endangers birds and other animals in the food chain

By **Max Hernandez-Velasquez**

HERITAGE ELEMENTARY SCHOOL

Hello residents of Lodi, this is an important message brought to you by Dr. Hernandez:

“I am here to inform you about the dangers of littering, and how dangerous it is to our environment, the animals, to us, and to our watershed especially.

“First of all, due to extensive research, and of course technology, we can confirm that if people keep throwing bad stuff on the soil it can kill the nutrients the soil has. Then, it won’t be able to support plants, nor would we be able to harvest the food that people and animals need. Something else we can confirm is that it’s really harmful to many animals that are native, and non-native. For example, let’s say an endangered bird species happens to live near your house and you just litter near the nest of the bird. The bird can eat, swallow, or even chew on something that it is not supposed to eat. The population of

that species could rapidly decrease ‘til it’s died out and there will be no more. And, if that animal dies out, it then could kill the whole food chain it’s in. Then, it could hurt the other food chains that depend on its food chain. Then the food web could get hurt, and if the food web dies and animals that pollinate couldn’t help the plants, the plants die, too.

“And this is something all scientists can agree on. It can destroy humanity drastically because, back to the animals. If they die, then our food source dies. So if the animals die, we follow right behind them. And if there is too much trash and litter, it can also affect global warming. It can also be bad for our health, because if germs, diseases, and bacteria build up it could create illnesses that could be fatal for the human body. Not only that, but it will make the water we depend on contaminated. And those are some details that show littering could really affect Lodi’s ecosystem and environment. So keep on cleaning Lodi, so it can be here for generations to come!”

Exploring with MSI in San Francisco Bay

By **Brittany Delgado Lopez**

HERITAGE ELEMENTARY

The Marine Science Institute is a wonderful place to visit, because you get to go on a huge boat and see the beautiful view. On the boat, which is named the Robert G Brownlee, students get to know the leaders who will take them to the stations, and students get to learn a lot of stuff that they probably didn’t know about.

One station is the Plankton Station. Plankton are drifting aquatic plants and animals. At that station students collect water from the bay, put the water in a test tube, and then use a microscope to see what type of plankton are in the water.

Another station that students visit is the Hydrology Station. Hydrology is the study of water. At that station students throw a bottle into the bay to collect water to test. Students test the temperature and the amount of salt, or salinity, in the water.

A third station to go to

is the Ichthyology Station. Ichthyology is the study of fish. At that station students work together with their team and their leader to throw a big net into the bay and then bring it back onto the boat. Everyone hopes to catch fish and other sea creatures. Once the net is back on the boat, students study everything that has been caught.

The last station is called the benthic station. At the benthic station students work together to scoop mud from the bottom of the bay. Then students study the creatures that live in the mud on the bottom of the bay. At the end, students put the mud on their face and promise to save the animals.

My class had so much fun and learned so much when we were on the MSI field trip. It was my first time getting on a boat, and it was very fun. Our boat was very nice, big, and cool. It was very exciting to get to do science experiments on the boat. I will never forget the experience that I had.

MARINE SCIENCE INSTITUTE AT A GLANCE

The Marine Science Institute was founded in 1970 with the goal of educating local students about the environment of the Sacramento-San Joaquin River Delta and the San Francisco Bay. The non-profit organization has the goal of building children’s curiosity about nature and teaching them to be good stewards by putting them in direct contact with the Bay and Delta environments.

The institute offers a number of programs aimed at students from kindergarten through college, including Marine Camp, which ranges from a day camp to a multi-day expedition depending on student grade level; school programs focused on exploring wetlands, beaches and lagoons, the Robert G. Brownlee Discovery Voyage and the MSI’s ocean lab and aquarium; and a number of family programs.

For more information, visit www.sfbaymsi.org.

— *Source: The Marine Science Institute*

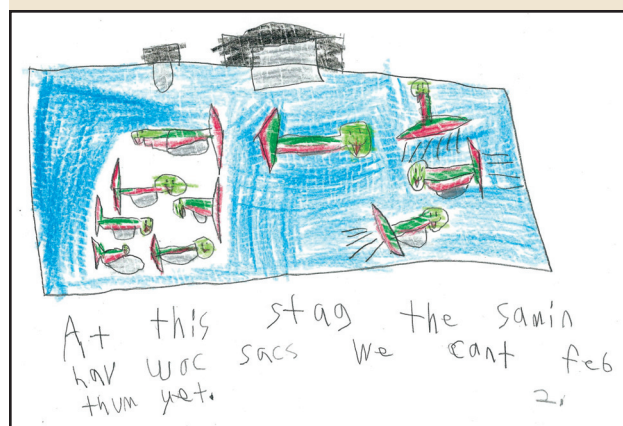
SALMON IN THE CLASSROOM

The salmon life cycle

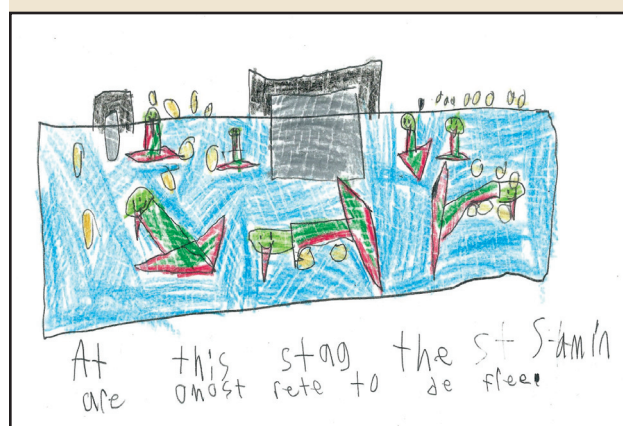
By Cole Bozeman
LOCKEFORD ELEMENTARY SCHOOL



At this stage, the salmon eggs don't really do anything.



At this stage, the salmon have yolk sacs. We can't feed them yet.



At this stage, the salmon are almost ready to be free.



At this stage, we release the salmon and the salmon has to take care of itself.



Now the salmon are full grown.

All about salmon, from egg to adult

By James Donally
TURNER ACADEMY

Salmon go through many changes in their lives. Salmon can jump up to 11 feet; that is like a human jumping over a two story building. Salmon are one of the few fish that are anadromous. Salmon can change many times in their lives.

The egg is the first stage of the salmon life cycle. They have black eyes in the egg. They are red, pink, orange and tiny. If the water is too warm they can hatch sooner or die. That is the first stage of a salmon's life.

The second stage of the salmon life cycle is the alevin. They stay in

alevin for four to six weeks to two months. Their yolk sack is still attached and is their food. This takes place in early spring. This stage is unique because they don't have to get their own food.

The third and fourth stages of the salmon life cycle are the fry and parr. Parr have camouflage and stripes. They eat plankton, eggs, insects and plants. They leave the redd and hide in plants and under rocks. Fry and parr are like young adults.

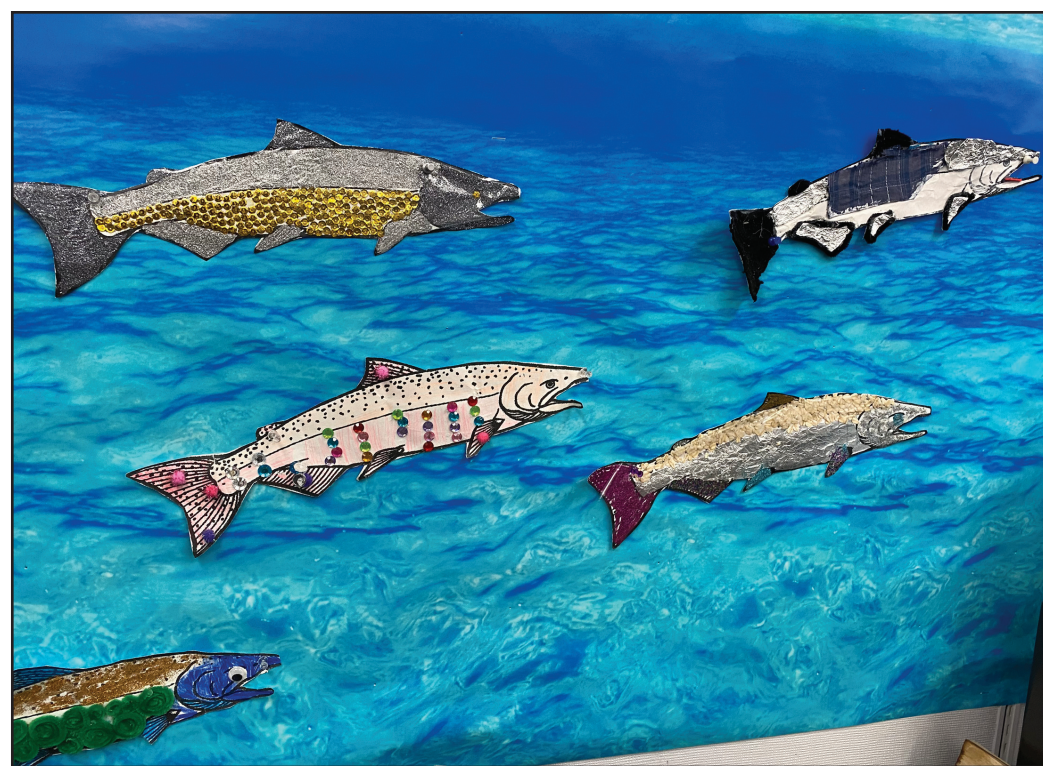
The fifth stage of the salmon life cycle is the smolt. They go to an estuary to get used to the salt water. They travel at night and hide in the

day so they are not found by predators. They follow the current to get to the ocean. The smolt stage is right before they become adults.

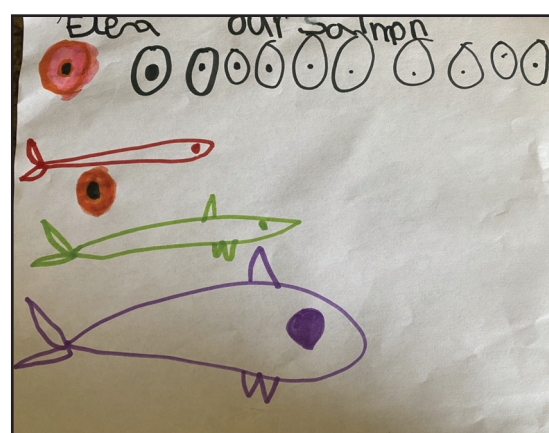
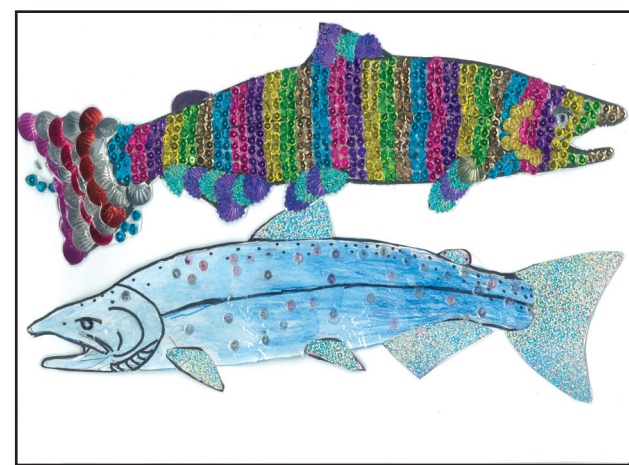
Adult salmon are the last stage of the salmon life cycle. They die a short time after they spawn. Salmon stay adults for two to fifteen years at this stage. Salmon can lay 1,500 to 10,000 eggs at a time. This is the final transition in their life cycle.

Salmon are unique fish. They are anadromous, they can go from salt-water to freshwater and vice versa. They have six life stages in their life cycle. They are an important part of the ecosystem. There are many reasons why salmon are interesting fish.

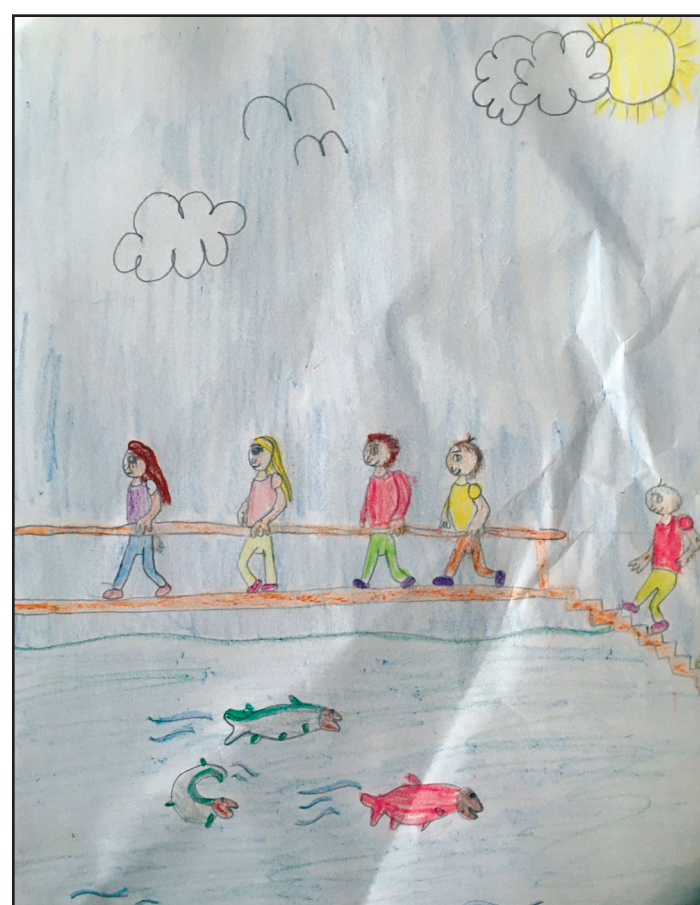
Salmon in the Classroom at Heritage Elementary



Left: Heritage Elementary School students were given an outline of a salmon to take home and decorate with their family, using items from around their house. Those salmon were posted on the "watershed wall" that was a backdrop for the school's tank with salmon eggs. Below left: Emmanuel Mendez, Nathalie Osorio and Jesse Granados chat while visiting the salmon tank. Below right: Salmon by Heritage students.



ELENA WALBRIDGE/WOODBRIDGE SCHOOL



CHARLOTTE STAMPER-PALMER/LOCKEFORD SCHOOL

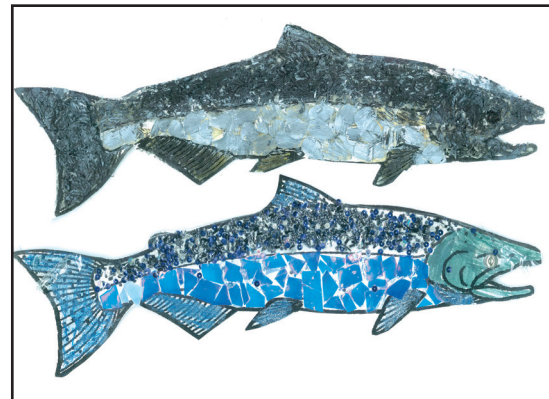
All about a salmon

By Rebecca Starr
VINEWOOD ELEMENTARY SCHOOL

A salmon is a type of fish that is born in fresh water and then migrates to the ocean. That makes salmon anadromous fish. Once the salmon are full grown they return to fresh water to spawn. Salmon are very important to the river's ecosystem. They bring back nutrients from the ocean to help the next generation of fish and other species to thrive. Salmon need cool, clean water to live so all the trash that humans put into rivers and streams can harm the salmon. That means we have to keep our waterways free of trash and pollutants.



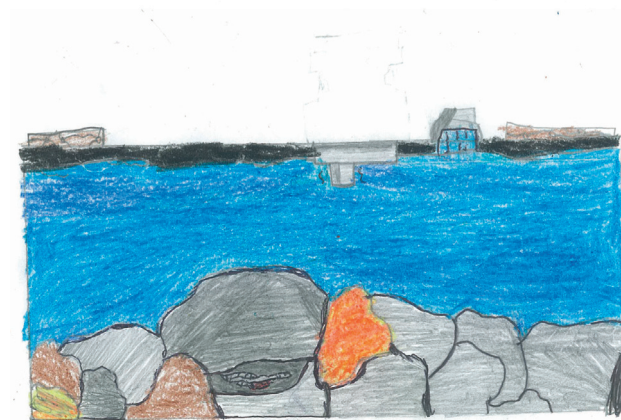
NYAH CROSBY/WOODBRIDGE SCHOOL



HERITAGE ELEMENTARY

Alevin Haiku

*Alevin, small fish
Camouflaging in the rocks
They hatched from an egg*



EDUARDO LOPEZ/HERITAGE ELEMENTARY

Cinquain

Salmon
Beautiful, fascinating
Hurdling, swimming, devouring
A salmon swimming gracefully
Fish



JAYLENE GUERRERO/HERITAGE ELEMENTARY