KIDS for the BAY

Report to the Alameda County Fish and Game Commission
December 15, 2022

INTRODUCTION

In the 2021 - 2022 school year, with the support of a $10,000 grant from the Alameda County Fish and Game Commission, KIDS for the BAY (KftB) delivered the Watershed Action Program (WAP) to seven classes in two elementary schools in Oakland and Hayward. KftB watershed lessons were successfully returned to the classroom, and engaged students in hands-on learning and helped them connect to their local watershed environments. The WAP included four watershed lessons and an Environmental Action Project for each class, as well as a bus field trip to a local creek or bay location.

Partner classes and schools included:

- Two third grade, one third/fourth grade and two fourth grade classes at New Highland Community School (previously named New Highland Academy) in Oakland
- Two fourth grade classes at Longwood Elementary School in Hayward.

Thanks to the support of the Alameda County Fish and Game Commission, KIDS for the BAY achieved the following goals:

- 185 students increased their knowledge of watershed science and became stewards of their local watershed environment
- 185 families learned how to reduce pollution to the local watershed
- Seven teachers increased their confidence in using the watershed as an educational resource
- The WAP was integrated into the curricula and culture of two partner schools.

Student participants in the WAP included an average 94% under-resourced, low-income students, 93% students of color, and more than 69% English Language Learners.

PROGRAM HIGHLIGHTS

Watershed Lessons

Watershed Investigations and Mini Watershed Experiment
Third and fourth grade students in Kameryn Sanchez's class at New Highland Academy in Oakland, eagerly greeted their KIDS for the BAY Educator Corey Chan as she entered the classroom. Some came in early from recess to peek into Ms. Corey's wagon and shower her with questions about the activities to come. "We already spent some time exploring the Virtual Watershed that you provided, and had a great time learning together," explained teacher Ms. Kameryn. A student named Jeymi's shared, "A watershed is an area of land where water that falls as rain all flows together into the same spot." Eliver added, "It's like there are a bunch of sinks around the area whose pipes connect and flow to the bay!"

Students were excited to build mini watersheds. Working in groups they built their mountains by crumpling a small piece of parchment paper and drawing water features like rivers and lakes with a blue marker. They drew the ridgetops with a brown marker. After making predictions about how many watersheds their models contained, it was time to let it 'rain' by spraying water onto the 'mountains'. Students eagerly observed how the water flowed down their 'mountains'. "We had a lot of smaller

puddles and when we added more water, the puddles connected. That's like watersheds in real life, they are all connected!" exclaimed Diana.

Watershed Scavenger Hunt
The students in both Mrs. Zsigo and Mrs. Pugh's classes from Longwood Elementary School in Hayward loved going outside and completing the watershed scavenger hunt. Students eagerly explored around the playground, working together to check off items from the list. As KIDS for the BAY Educator Shay Hart moved from group to group, she heard exclamations of wonder. Yazmin shared, "Wow look at this storm drain. I never knew this was right here on our playground!" Samari said, "Look at those beautiful birds flying in the sky!" The students curiously explored a storm drain and Meggan observed, "This must lead to Sulphur creek." Students also happened upon a large mushroom they were fascinated by. Angel wondered,"Why are there so many holes in it?" Bryan pondered this for a second then responded, "Maybe it's so water can get in easily." The students excitedly ran around to other groups and took them to observe the beauty of their mushroom. Students all agreed that being outside in their watershed and exploring with a scavenger hunt was their favorite part of the day so far!

San Francisco Bay Estuary and Pacific Ocean Satellite Map Investigations
Ms. Kameryn's students at New Highland Academy were so excited to look at the giant maps in Ms. Corey's wagon. Ms. Corey asked what each color on the map represented. All students were quick to call out the blue as water, but not as many were sure why there were different shades of blue. "The darker blue in the ocean is much deeper water," declared Ashley, "The areas that are lighter and greenish in the bay, are much more shallow." When it came time to write on the maps, teacher Ms. Kameryn numbered each of the items on the list to find and the students eagerly called out a number to claim the first location they were looking for. Students shouted out their findings around the room. Jadamarie admitted, "I didn't know where the Golden Gate Bridge was located and now I know." When Ms. Corey told her that it is possible to see the bridge from this side of the bay in some places, her eyes lit up with excitement at the possibility of seeing the famous Golden Gate.

Estuary Studies, Bay-Ocean Models, and Pollution in the Watershed
Students in Ms. Pugh's class at Longwood Elementary were excited to learn that they were going to be making their own models of the San Francisco Bay. Alana announced, "I love making things. I think I want to be an engineer someday." Students carefully studied their maps of the bay and constructed their bridges and islands. They were amazed at how many bridges exist in the bay area. Ms. Shay asked them to point to the rivers and the ocean before starting their experiment. When she counted to three, and said, "Estuary!" students made it 'rain' over the rivers, and poured the saltwater gently into the Pacific Ocean. Pablo observed, "Wow look how the water is changing color! We are making brackish water!" Students were most amazed at the two waters combining together in the bay just like in real life estuaries. When the food coloring representing pollution entered the models, Vivian emphasized, "This really shows us how we are all connected in the same watershed, and how our actions affect the whole ecosystem."

The Storm Drain System and the Sanitary Sewer System
Mr. Manning's fifth grade class at New Highland was intrigued to learn more about the storm drain system and how it works. Zaheim asked, "Why don't people make storm drains so that only water can enter?" Many of the students agreed and wondered why that was not thought about in the first place. KIDS for the BAY Educator Yvette Diaz Samayoa explained that when storm drains were being created, engineers must have only thought about water entering as quickly as possible to help manage flooding during heavy rain storms. Understanding of the pollution carried in the stormwater must have come later.

Plastic Pollution and its Impact on Aquatic and Marine Life
Students in Ms. Annie's class at New Highland were saddened by the images of aquatic life harmed by plastic pollution that was created by people. The students also expressed concern that humans are ingesting plastic almost as often as animals are through the process of biomagnification of microplastic pollutants in food chains. Derek wondered, "Wouldn't the plastic dissolve in our stomach acid?" Ms. Yvette explained that while food that is eaten gets digested, plastic acts differently in our bodies than food we consume. Plastic gets broken down into smaller pieces called microplastics, but these are still toxic and harmful to people and wildlife. The students were very interested in this conversation about pollution and its harmful impact on the environment. All students were eager to take action to help solve this pollution problem.

Neighborhood Survey and Trash Cleanup
After learning about pollution and how harmful it is to the environment, students in Ms. Alter's and Ms. Davis' classes at New Highland were determined to clean up as many pieces of trash as possible. Edgar and his group raced over to where the storm drain was to grab what they could so it would not go down the storm drain. Fatima observed, "There's a trash can right next to here! Why can't people just throw their trash away in the right spot?" The other groups ran over to the fences and bushes to see if there was any trash hiding. "Wow, look at that pretty flower. It's dying because of all the trash!" Mary noticed. Both classes were proud to clean up the trash and collected a total of 715 pieces of trash from their school campus!

Preventing Pollution and Practicing the Five Rs
Students learned about various alternatives to pollution. Miguel brought up that his grandma reuses paper plates so he was familiar with the concept of reusing. Giselle shared how she reused the bottom parts of a water bottle as planters to grow new plants and that she even uses the top part as a funnel. Beyker said that his family keeps their plastic bags to reuse them later on. A few students also mentioned reusing items for an art project. Ms. Yvette was very proud to hear how well the class is doing with reusing items! Overall, many of the students understood the importance of practicing the Five Rs but most of them did not know that plastic wrappers cannot be recycled, so it was very important to go over which items can go in which bins for recycling.

What is a Food Chain?
Many students in Ms. Zsigo's fourth grade classroom at Longwood Elementary were excited to learn about food chains. Bryan shared, "A food chain is when an animal eats another animal, and it keeps going in a cycle." The class made a food chain together to act out this concept. Angel raised his hand and also shared, "Photosynthesis is when plants make their own food from the sun!" Comparing a food chain to a food web, Ashley explained, "A food web is like a spider web because there are lots of different connected possibilities."

Bay Organisms Investigations
Ms. Kameryn's class at New Highland Academy were excited to share ideas about the adaptations of the seaweed, crab, and fish that they investigated with KIDS for the BAY. Wilmer suggested, "The bull kelp seaweed float keeps the seaweed from sinking." "The float helps it stay near the surface so it can get sunlight to grow," added Eliver. Students used their senses to closely observe the seaweed. Some noticed that it smelled familiar. "It reminds me of tajin," said Rafael. "It reminds me of caramel," shared Jeymi. Jada said the texture of the wet algae was slimy but that it also looked like skin.

Teacher Ms. Kameryn reminded the class that for the fish and crab study, they could look for adaptations in the animals bodies as well as think about their behavioral adaptations. Many students thought about defense mechanisms. "The top fin of the fish can stab something if it tries to eat it," shared Jose as he

pulled the dorsal fin up, showing off the pointed spines. Allison noticed a hard part on the side of the fish and Ms. Corey explained the purpose of the gill cover, protecting the soft, fragile gills underneath. "The scales also protect the outside of the fish," said Ashley. Jerson hypothesized, "The crab has a small mouth so I think its food is small, too. Looking at how the legs bend, I think they only go from side to side." Ms. Corey and Ms. Kameryn were delighted to hear the students discuss different ideas for the organism adaptations and provide informed guesses for their purposes.

Environmental Justice Movement and Environmental Leaders
Students at New Highland Academy were very excited to learn about environmental leaders in their own California community, particularly Mackenzie Feldman, a young environmentalist who attended the University of California in Berkeley. The main focus of her work was to get harmful pesticides banned from all UC campuses, as well as from elementary school campuses in her hometown of Hawaii. Her mission was successful, and the KftB students connected with her environmental action project. Multiple students shared that they were running for student council and had just given speeches during lunch. "I am running for student council because I want to be a leader and help my school and the other students here. I think I can help make the school a better place," shared Alana. It was inspiring to see these young students taking on leadership roles just like Mackenzie!

Environmental Action Projects

Natural Pesticides
Our young environmentalists at Longwood Elementary were very excited to help make a difference at their school with their KIDS for the BAY Natural Pesticide Action Project. The classes were excited to start the process of making their natural pesticides. First, they discussed potential alternatives to use instead of pesticides. Ryzll suggested, "Maybe we could control bugs with other bugs!" which gave the class an opportunity to discuss bio-control. Bryan shared, "Maybe something spicy would keep bugs away!" After this review, the students prepared natural pesticide recipe cards to take home and share with their families. While the students were decorating, Ms. Shay called groups up to help with the chopping of jalapenos and garlic. They loved pretending to be chefs as they carefully chopped the jalapenos and garlic. "I cook with my mom all the time, so I know how to properly chop," said Jonta. "I can see how jalapenos and garlic can make pests go away, they smell so strong," added Adeline. Once everything was chopped, the students added the ingredients to a blender and blended them with water and biodegradable dish soap to make the pesticide. This solution was then bottled up and ready to be used. "We will have to start using these natural pesticides on our gardens at the school. I will talk to the gardener this week," announced class teacher Ms. Char. "I'm excited to share my recipe card with my mom because she has a garden. Maybe now we can make natural pesticides together to use in her garden," said Ivan.

Student-led Watershed Protection Assembly
Ms. Annie's class from New Highland Academy presented the KIDS for the BAY assembly to another class at their school to teach them all about reducing stormwater pollution and practicing the Five Rs: Refuse, Reduce, Reuse, Recycle, and Rot. Students in the audience were excited for the sections of the performance with audience participation where they could shout out things like, "Storm Drain Rangers, YES WE ARE!" and "Nooo!" when being asked if littering is okay. The performers did a wonderful job making sure that they were speaking clearly and projecting their voices, so that they could teach other students how to take care of their local watershed. Ms. Yvette was very impressed with how the young Environmentalists engaged in their roles, and brought them to life.

Bay and Creek Field Trips

Sunol Regional Wilderness
It was a cool and crisp spring morning when the students from Longwood Elementary arrived at Sunol Regional Wilderness for their field trip. They jumped off the bus with enormous grins on their faces. “Wow, this place is so beautiful,” said Adeline. “We are so excited to be here. This is the first field trip of the year for many of our students,” shared class teacher Mrs. Amy Zsigo. This field trip was an extra special experience because two Avila and Associates biologists, Whitney and Cynthia, were joining for the day to help out. “Wow, I can’t believe we get to spend the day with real scientists, this is the best day ever!” exclaimed Ghael.

For their first activity, the group made their way down to the creek to begin their aquatic invertebrate investigation and learn about the different types of invertebrates they might discover in the creek. “I had no idea dragonflies started their lives out in the water. It’s so crazy how different the baby form looks compared to the adult form,” observed Alexis. Alana added, “When the baby looks completely different from the adult, that is called complete metamorphosis and when it looks a bit different that is incomplete metamorphosis!” The students were particularly amazed by the caddisfly larva and really hoped to find one. “What an awesome adaptation they have to make protective armor for themselves using sticks or rocks. If we are lucky enough to find one, I wonder what material it will be using,” said Jonta. Down by the banks of the creek, the young scientists began searching for aquatic invertebrates. Brian’s group ran up to Ms. Shay and said, “Look, look! We found a caddisfly larva!” Everyone hurried over to confirm this amazing discovery. “This caddisfly made their armor out of rocks! We only saw it because we saw the tiny head sticking out,” explained Arelly. “I had no idea all of these amazing creatures live just beneath the surface of the creek. I will never look at a creek the same way again,” exclaimed Roxana.

Before setting out for a nature hike adventure, Avila biologists Whitney and Cynthia led a discussion with the group about how to effectively use binoculars, and shared helpful tips for how to look for birds. “The trick is to always look at a bird with your bare eyes first, before using the binoculars. That way you can pinpoint its exact location before you start to zoom in,” explained Cynthia. With binoculars and field guides in hand, the class started their hike along the Indian Joe Nature Trail. Whitney often stopped to point out various native plants and shared fun facts about each species with the students. “The sycamore’s bark is so unique. It almost looks like a camo pattern,” shared Yamileth. “I didn’t know these trees were called sycamores before today, but I see them all over near my house,” added Alan.

As the class continued down the trail, they kept their voices nice and low to increase their chances of seeing and hearing wildlife. Kimberly suddenly stopped dead in her tracks and made the silent ‘wildlife spotting’ motion. She silently flapped her wings, signaling for everyone to follow suit until the whole group was completely silent. Kimberly whispered, “Look! It’s a small black, white, and red bird in that tree!” The students looked through their binoculars and consulted their field guides. After some consideration and quiet group discussion, Jessi announced that he thought the bird they were looking at was an acorn woodpecker. The other students agreed and asked Whitney and Cynthia if their identification was correct. “Yes! That is correct! That bird is indeed an Acorn woodpecker! Great job scientists,” they said.

As they finished lunch, students began asking for reusable bags and tongs and began picking up trash items around them. Adult chaperones joined in the creek cleanup, and everyone was shocked to find so much trash near the creek and along part of the trail. Alexis wondered, “Why would people do this? This may not only hurt us humans, but all of the wild animals that live here!” Kimberly added, “This could entangle birds, preventing them from flying or eating! I am so glad we are here to pick up this litter!” Together, the two classes cleaned up around 11 gallons of trash and were very happy to be watershed

and wildlife stewards on their field trip!

Before going back to school, the group gathered for one last closing circle and reminisced about their favorite parts of the day. “My favorite part was learning about the invertebrates and finding a caddisfly larva,” shared Madeline. “I loved our nature hike and discovering the acorn woodpecker,” added Daylin. “I had no idea this place existed, and I can’t wait to bring my family back here to explore more,” said Alexis. “Thank you so much for this amazing field trip experience. I know this is something everyone will remember forever,” said teacher Mrs. Zsigo. The students piled back onto the bus with huge grins on their faces, thankful for this wonderful day out in nature.

Crab Cove in Alameda
Ms. Davis’s third grade class from New Highland Academy started their field trip adventure at Crab Cove, with a brief introduction to the habitat, the agenda for the day, and expectations. Then the class eagerly headed down to the rocky shore. Ms. Shay showed the bay animal cards and went through some of the organisms that they might find. The students learned about making crab caves, and using their science skills to practice close and respectful observations of the living and nonliving things they found. The class spread out across the shore to start their explorations. In no time at all, students were calling out about their observations of all of the crabs. They found a variety of crabs in different sizes, colors, and shapes. The class probably discovered over 100 crabs! They loved carefully turning over rocks to look for them. They also remembered how to determine the sex of the crabs and were quite fascinated with determining whether they were males or females. “This crab has a ‘V’ shape so it is a boy, and Mikaile’s has a ‘U’ shape so it’s a girl,” shared Kyh'ree.

One of the student’s favorite parts of the field trip was the trash cleanup. Alan was having so much fun collecting trash items from along the beach and paths. “I love picking up trash. At first I wasn’t sure about doing it, but then I began finding so many pieces of trash and it got really exciting. I want to keep picking up trash all day. I am sure we have helped the animals in the bay today!” he said. The students were so excited to learn that together they cleaned up over 16 gallons of trash, and helped to protect the special wildlife they had the chance to meet during their time at Crab Cove.

PROFESSIONAL DEVELOPMENT FOR PARTNER TEACHERS

KftB partner teachers increased their confidence and skills in teaching environmental education through observing and participating with our Educators as they led the watershed lessons. They were thrilled with how much their students learned. Some quotations from teacher participants are shared below:

> “My students are much more aware of litter and how it affects the bay. They also have an increased concern with regard to plastic and how it hurts our watershed and wildlife. The field trip exploration in Alameda creek was engaging and allowed our students to make connections between the creek and what they have learned about the estuary. The students loved observing living organisms in the creek, recording them, and making a claim based on the evidence. This program has given me great lesson ideas!”
> Charlene Pugh, Fourth Grade Teacher, Longwood Elementary School, Hayward

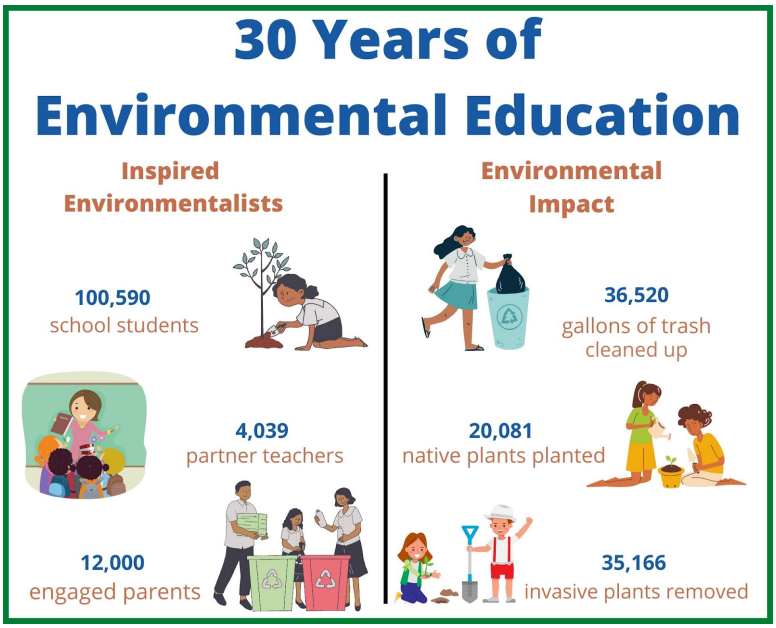
> “We did a clean up on our own during our Tuesday Science time and the students loved it! They filled an entire 50 gallon trash can from one fence line along our schoolyard and honestly could have kept going!”
> Kameryn Sanchez, Fourth Grade Teacher, New Highland Academy, Oakland.

2022-2023 SCHOOL YEAR

In the current school year we are excited to have already begun school visits to teach engaging, hands-on lessons and connect students to their local watershed environment. Our students are diving into hands-on watershed science activities in the classroom, connecting with their local environment in watershed scavenger hunts outside, and conducting school campus and neighborhood trash cleanup projects to prevent litter from entering the storm drain system. Cleveland Elementary School in Oakland will be doing the 'Caring For Our Watersheds' Action Project in a special collaboration with the Rotary Nature Center at Lake Merritt, where they will conduct water studies and explore organisms living in and around the estuary. The other Environmental Action Projects are still to be determined. We also plan to lead nature-based bus field trips where students will study and explore a special bay or creek habitat. WAP spaces this school year filled quickly with partner teachers eager to work with KIDS for the BAY. It is inspiring to know that so many teachers are committed to incorporating hands-on environmental education into their curricula. With the support of our funders and donors, we will continue to deliver engaging and equitable environmental education programs to our under-resourced partner schools.

30 YEAR ANNIVERSARY!

KIDS for the BAY is currently celebrating our 30 Year Anniversary and 100,590 students who have graduated from our programs as Inspired Environmentalists. We have partnered with 4,039 teachers to provide them with resources, curricula and programs. In addition we have engaged more than 12,000 parents/caregivers in their childrens' learning in environmental science education. The infographic below shows the impact that our work has had on the community and on the environment.



KIDS for the BAY has also had a *30-year commitment to the values of diversity, equity and inclusion.* We are a women-founded and led organization, started at a time when there were very few women Executive Directors in the environmental field. The majority of our current and past staff includes women and people of color, and many have become leaders and change agents in the field of environmental education. Please visit our 'Past Staff - Where Are They Now?' webpage to learn more about their accomplishments: https://kidsforthebay.org/about-us/past-staff-where-are-they-now/