



Why is the Mokelumne River Fish Hatchery so successful?

Reese Ouimette

MILLSWOOD MIDDLE SCHOOL

The Mokelumne River Fish Hatchery is located just downstream of the Camanche Reservoir.

The Mokelumne River Fish Hatchery raises Chinook Salmon for release to the Mokelumne River. The hatchery is one of the most successful in California, setting a record of 30,000 fish counted returning to the river to spawn this fall run.

But what makes the

Mokelumne River Hatchery more successful than other hatcheries?

The reason is because of their procedures.

In 1963, the Mokelumne River Fish Hatchery was built to make up for the loss of fish areas when the Camanche Dam was built.

In 2002, the hatchery was updated to better raise the salmon. This was done by adding water chillers, sediment filters, and UV that kill disease-causing microorganisms to keep the water clean and safe.

This makes the hatchery very successful, with about 96% of the fish eggs surviving to the small fish stage. This is a much higher percentage than other fish hatcheries in California.

These upgrades also help the young salmon get used to living in the wild after growing in a safe environment. Once ready, the small salmon are taken to the Delta River, where they will be released into net pens to protect them from predators.

HATCHERY continues on Page 6



ALEX VASQUEZ / MILLSWOOD MIDDLE SCHOOL

ANCHORS AWEIGH WITH MSI



JESHUA MOREJOHN / HOMESCHOOL

Each year, students in the Lodi Unified School District have the opportunity to participate in a four-hour expedition aboard a working research vessel, the Robert G. Brownlee, operated by the Marine Science Institute. The Brownlee takes students out into the San Francisco Bay, where they can learn how to use scientific research equipment to explore the ocean waters — the endpoint of the Mokelumne River watershed. Here, students who participated in the research trip write about what they did and what they learned from the experience.

How climate change is affecting the Mokelumne — and how we're adapting

Abhijot Singh

MILLSWOOD MIDDLE SCHOOL

The Mokelumne River is super important to our community. It provides 40% of the water in Lodi, and it's a big part of what makes Lodi such a great place to live. But lately, the river has faced major problems due to climate change.

What's happening to the river?

One of the biggest changes is that the snow in the Sierra Nevada mountains is melting earlier than it used to. This problem is because the snowpack acts like a water reservoir for the Mokelumne River. When it melts too early, we run out of water later in the summer when we really need it.

The river is also getting warmer because of higher temperatures. Fish like salmon, which need cold water to survive, are struggling.

On top of that, there are more droughts and bigger storms than before. Droughts dry out the river, and storms cause flooding, which damages the riverbanks and wash away plants and soil.

How are we dealing with it?

Even though these changes are tough, our community is doing a lot to help the Mokelumne River.

Farmers are using new tools like drip irrigation to save water. For example, our local vineyards in and around Lodi primarily use drip irrigation. This efficient method ensures each vine gets the precise amount of water needed, reducing waste.

People are planting native plants and trees along the river to protect it from erosion and create habitats for animals.

We're also working on saving more water during big storms by building better reservoirs and storing water underground. That way, we'll have more water when there's a drought.

CLIMATE CHANGE continues on Page 2



MCKENNA MOREJOHN / HOMESCHOOL

Plankton play a unique role in the ocean food chain

Izzabella Gendjar

WOODBIDGE ELEMENTARY SCHOOL

The word plankton comes from the Greek word "planktos" which means drifter. Plankton are drifting organisms that are found in both freshwater and saltwater ecosystems. Plankton do not swim or stay stationary, but rather, drift or float where the current or tides take them.

There are two main types of plankton: phytoplankton (plant-like) and zooplankton (animal-like). Not all plankton

can be seen by the naked eye because they are microscopic. You would be amazed at all of the living creatures that live in just one drop of water! Placing a drop of water under a microscope reveals a variety of plankton that appear to be wiggling about.

While many plankton are microscopic, plankton also includes some larger organisms like crustaceans and jellyfish. These larger organisms are defined as plankton not by their

MSI TRIP continues on Page 3

Storm Drain Detectives put water fleas to work testing toxicity

Lola Fogelberg

WOODBIDGE ELEMENTARY SCHOOL

On November 19 and 21, 2024, some of Lodi Unified School District students who are involved in the Storm Drain Detectives water monitoring program were invited to attend the Water Toxicity Workshop at Lodi High.

Here, students worked alongside Dr. Stephen Clark of PacificEco Risk, to test local river, canal, and lake waters for toxicity using Daphnia magna, also known as water fleas.

The main idea of this workshop was to find out how the city's runoff affects the health of our waterways.

To determine if any of the water we sampled were toxic, we first had to count how many water fleas we started with in each sample. We recorded our data.

When we reconvened two days later,

we had to recount the number of live organisms and compared that to our original data of how many organisms we had started off with.

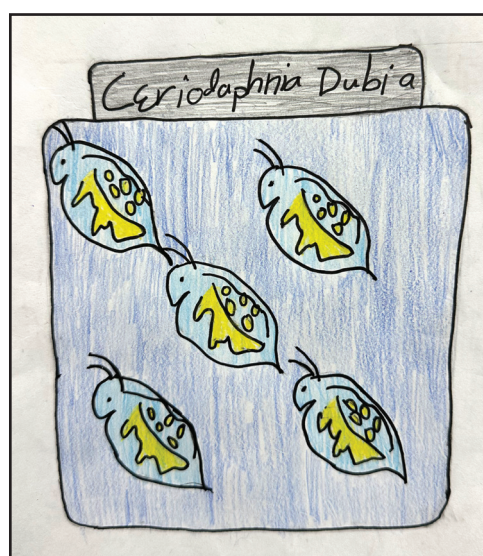
Each test sample started off with 100% of the Daphnia magna living, so it was fair when we did our experiment. Our control remained at 100% survival, which means it was not toxic at all.

The survival rate for Sample B was 90%, which was in the healthy/non-toxic range. The survival rate for Sample C was 95%, also non-toxic range.

The survival rate for Sample D, however, was 80%, which falls in the toxic range. This was the water collected from the canal near Harney Lane.

Next we learned about a different kind of water flea called Ceriodaphnia dubia — a common freshwater zooplankton species.

DETECTIVES continues on Page 2



LYRA MIXON / WOODBRIDGE ELEMENTARY

HELPFUL LINKS

- **Sierra Nevada Conservancy:** www.tinyurl.com/SierraNevadaConservancy
- **East Bay Municipal Utility District (EBMUD):** www.tinyurl.com/EBMUD-PDF
- **U.S. Forest Service:** www.tinyurl.com/ForestService-Mokelumne
- **Sustainable Conservation:** www.tinyurl.com/SustainableConservation-PDF
- **CERES: What causes climate change:** www.tinyurl.com/CERES-ClimateChange

INSIDE:

Watershed puzzles offer plenty of fun **PAGES 2, 4, 5 & 6**

More fun and learning with the Marine Science Institute in San Francisco Bay **PAGES 3 & 4**

Salmon in the Classroom program gives a glimpse into the lives of fish **PAGE 5**

STORM DRAIN DETECTIVES

Storm Drain Detectives help city keep an eye on water quality

Aria Buno
WOODBRIDGE ELEMENTARY SCHOOL

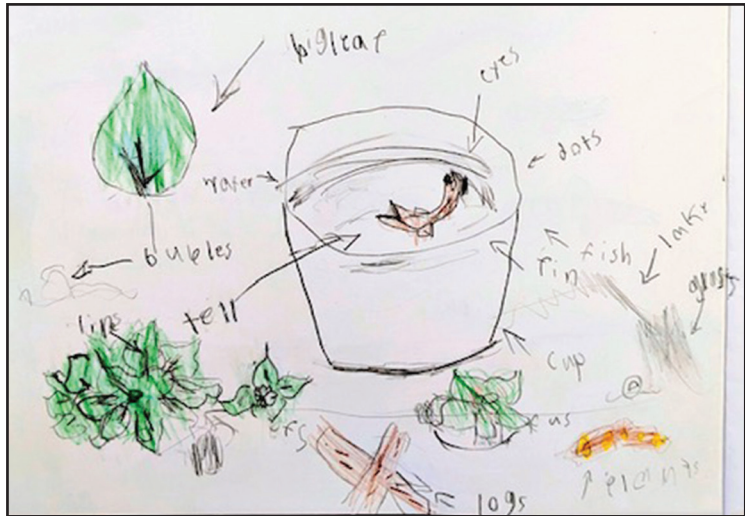
Twice a month, students from several different Lodi Unified schools take part in the Storm Drain Detectives program through the City of Lodi.

The program is headed up by Kathy Grant, who trains students and teachers on how to use equipment to monitor the city's storm drain runoff. Students learn how to calibrate and operate the equipment and then run different tests and record their data to monitor the health of our waterways. This data is then

published online and helps educate others about the importance of doing our part to keep our waterways clean. Each monitoring day, students grow in their ability to understand the river's pH, water temperature, levels of oxygen and nitrates, turbidity and electrical conductivity.

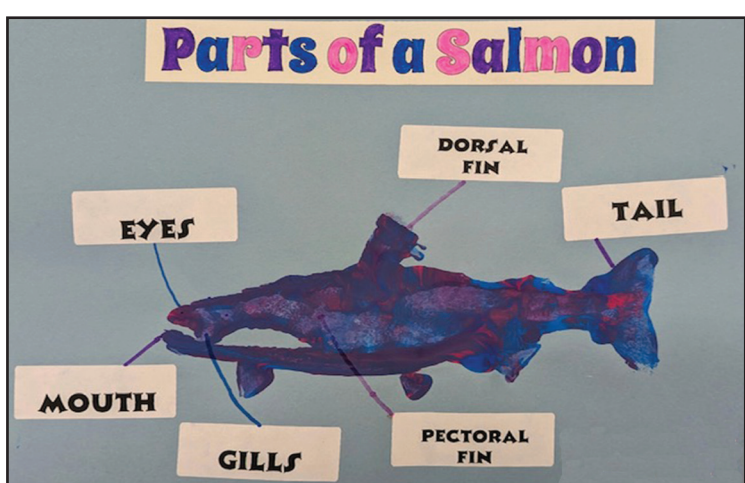
Students in the program use science, technology, engineering, and math skills to record and interpret their data. Students also take a water sample back to class where they set up plates to test for bacteria. They mix coliscan and the sample water collected to form a gel-like substance.

Then they put the plates in an incubator to test for bacteria growth. This program has helped students learn about the importance of being stewards of our waterway and helping educate others about the importance of keeping our waterways clean and healthy.



ALEEMA MOHAMMED / BECKMAN ELEMENTARY SCHOOL

Salmon fry release: March 3, Mokelumne River. I noticed it wanted to escape from me. It didn't come back to me and it's been long. I miss them.



LEAH VARGAS / BECKMAN ELEMENTARY SCHOOL



SOPHIA KHOURY / REESE ELEMENTARY SCHOOL

CLIMATE CHANGE

Continued from Page 1

Schools and organizations are teaching kids (like us!) about why the river is so important; for example, Storm Drain Detectives and other volunteer groups. They're showing us how we can take care of the lake, like by using less water at home and not polluting.

Why it matters

The Mokelumne River is a huge part of our lives. It gives us water to drink, helps farmers grow food, and supports so many animals and plants.

If we don't take care of it now, it might not be there for future generations.

We all have a part to play. Whether it's conserving water, planting trees, or just learning about the river, everything we do can help. The Mokelumne River has been there for us for so long — now it's our turn to take care of it.

DETECTIVES

Continued from Page 1


C. dubia is one sixth smaller than the *Daphnia magna*. *C. dubia* is preferred for aquatic toxicity testing for three reasons. First, they are highly sensitive to water pollution.

Next, they have demonstrated excellent correlations of test results so they are a very trustworthy water flea. Third, it is a standard test organism used for assessments of effluents discharged into freshwater systems. The life cycle of *Ceriodaphnia dubia* is fasci-

nating. It involves asexual reproduction under normal conditions, meaning the females do not need males to reproduce. First, it starts out as an egg. Next it turns into a juvenile. The third stage in the life cycle is the adolescent stage. Last, it becomes an adult. Monitoring the health of our

waterways is extremely important. This lab provided students with the opportunity to monitor in yet another way than what they do during their monthly monitoring for the Storm Drain Detectives program. It gave them some hands-on experience and

helped them see what an actual scientist does in the lab. Students hope to take the knowledge gained from this lab to continue their efforts in helping to educate others their age about the importance of doing our part to keep our waterways as clean as humanly possible.



SALMON

WORD SCRAMBLE

Unscramble the following salmon words, write the words in the circles, the blue circles are used to solve the riddles below. Good Luck!

ERDD ○ ○ ○ ○

STOKYENE ○ ○ ○ ○ ○ ○ ○ ○

SLAOMN ○ ○ ○ ○ ○ ○ ○ ○

TWARE ○ ○ ○ ○ ○ ○ ○ ○

ELKA ○ ○ ○ ○ ○ ○ ○ ○

YFR ○ ○ ○ ○ ○ ○ ○ ○

Riddles

Salmon use me, I am powerful, I look gorgeous, but get to close and I am dangerous.

○ ○ ○ ○ ○ ○ ○ ○ ○ ○

10 FISH ARE IN A RIVER, 10 DROWN. HOW MANY DIED?

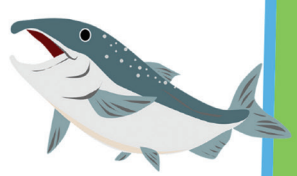
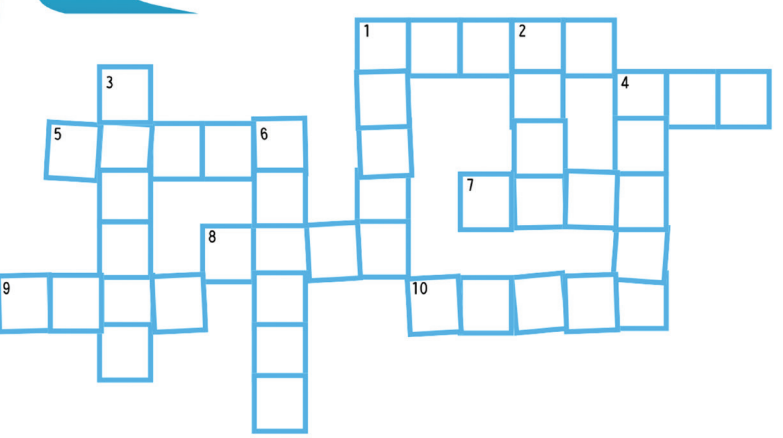
○ ○ ○ ○ because fish can't drown

JULIA MDALAL & AALIYAH MARTINEZ SANTOYO / JOHN MUIR ELEMENTARY SCHOOL

MOKELUMNE CURRENT

CROSSWORD PUZZLE

Read the clues below and fill in the grid.

ACROSS

1. A young salmon (or trout) when it becomes silvery and migrates to the sea.
4. You will be in ___ when you see the Mokelumne river.
5. There are many of these along the river.
7. A nest where the female salmon lays her eggs
8. In some parts of the river it is ____.
9. Trees are made out of this.
10. When it rain a lot it may ____.

DOWN

1. There are a specific species of this called longhorn that live along the river
2. To be alive.
3. A large fish that live in the Mokelumne river and that migrates to the sea.
4. The river is ____ by humans.
6. The river source of water comes from the ____ Nevada.

FERN STAHLSCHEIDT & AREMI OROZCO-LOPEZ / JOHN MUIR ELEMENTARY SCHOOL

The students of Beckman, Erma B. Reese, John Muir, Lois E. Borchardt, Lakewood, Vinewood and Woodbridge elementary schools, as well as Millswood Middle School, would like to thank the following sponsors for their support:

Lower Mokelumne River Partnership

est. 1998

MARINE SCIENCE INSTITUTE

Meeting the fishy residents of San Francisco Bay

Ezekiel Christensen
WOODBRIDGE ELEMENTARY SCHOOL

Ichthyology is the study of fish. During our recent MSI field trip, we were able to have an entire rotation dedicated to Ichthyology.

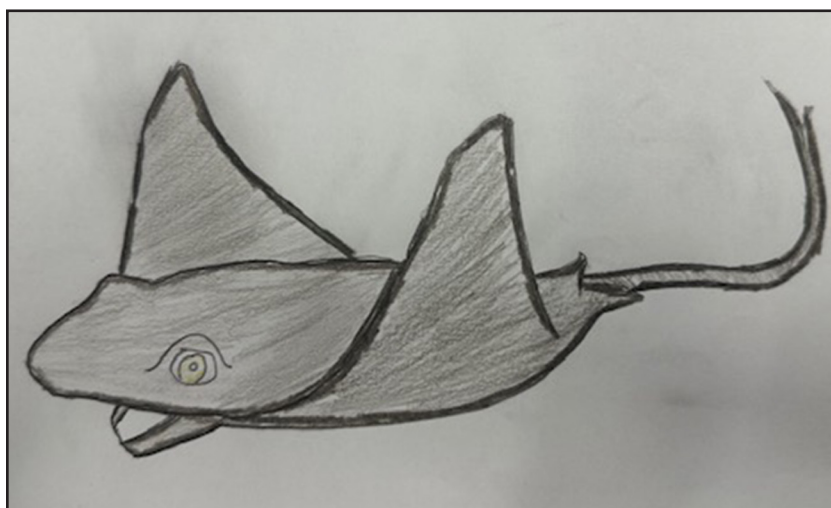
During the Ichthyology station, we learned about the different types of fish in the San Francisco Bay. First, we cast out a large net and drug it for a few minutes behind the boat. Then we all worked as a team to pull in the large net. We had to be careful to follow the commands that our station leader was calling out so we could keep the net even.

Once we pulled in the net, we were eager to see what we caught. My group caught three flat fish and a stingray!

We studied the stingray and found out it was a male. The stingray has a stinger that could cause a painful wound.

We also learned about different adaptations some of the fish had developed to help them survive in their habitats. One of these adaptations was that some types of flat fish have an eye that migrates to the other side of their head, which results in both of their eyes being on one side.

I loved learning about the amazing fish in the bay.



JAXXON WELLS / WOODBRIDGE ELEMENTARY SCHOOL

MSI TRIP

Continued from Page 1

size but because of their inability to swim against currents.

Even though most plankton are microscopic in size, plankton play a crucial role in marine ecosystems. Plankton are the base of the entire aquatic food web.

Zooplankton and other marine life eat phytoplankton and then become food for fish, crustaceans, and other larger species.

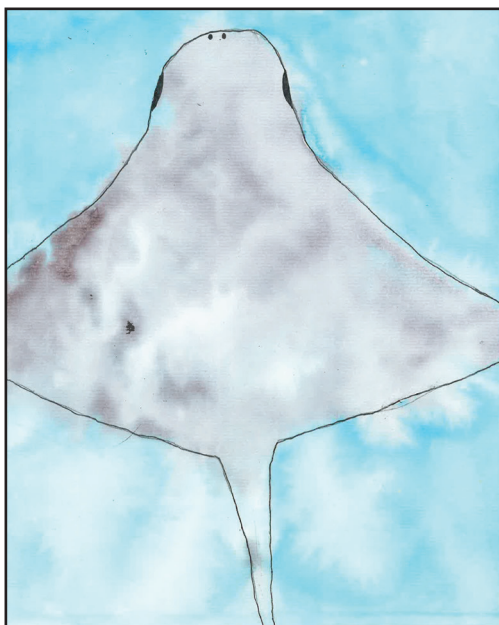
Phytoplankton make their energy through photosynthesis, a process which uses sunlight and chlorophyll. Like other plants, phytoplankton take in carbon dioxide and release oxygen. Phytoplankton are one of the world's most important producers of oxygen.

While plankton are needed for marine ecosystems to thrive, too much plankton in one area can result in a serious environmental problem. When too many phytoplankton are in one area, this can lead to too many nutrients in one area and can create a bloom.

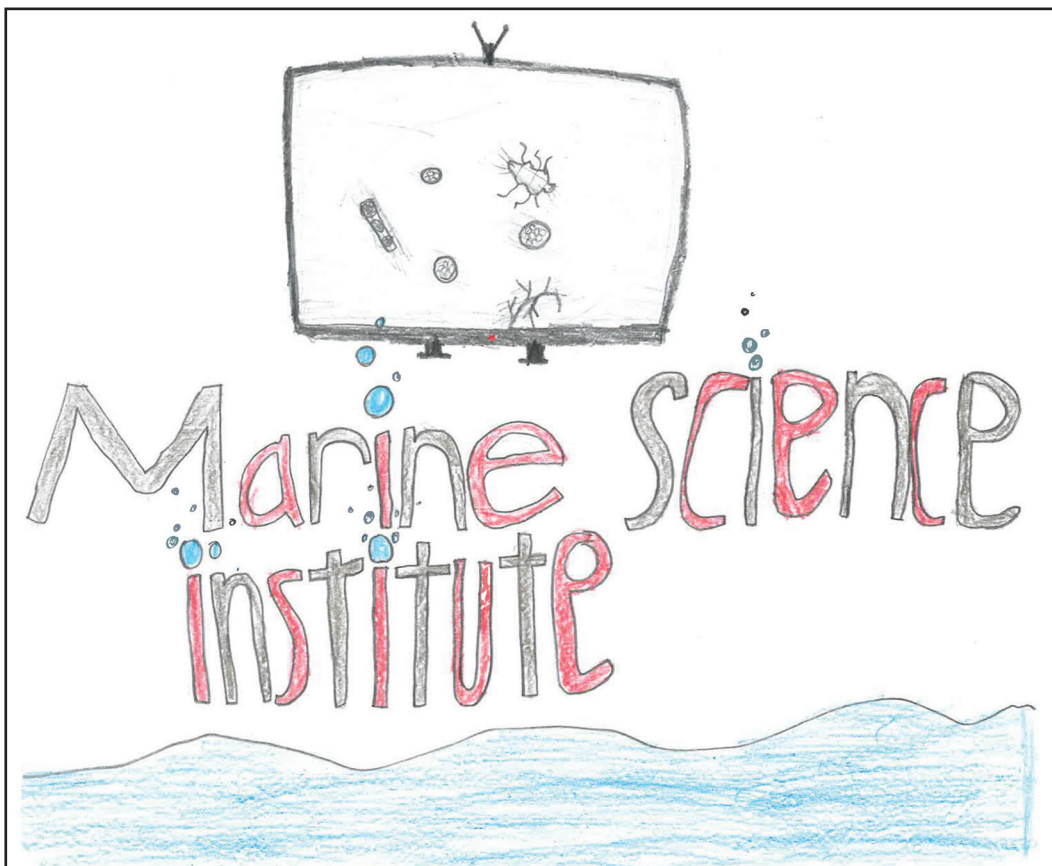
When a bloom occurs, certain phytoplankton release harmful toxins which can result in a red tide or algal bloom. These conditions disrupt the marine ecosystem and can contaminate fish which can lead to their death.

Contaminated fish that are caught and served to people can cause serious illness or even death to the per-

Scenes from the Robert G. Brownlee



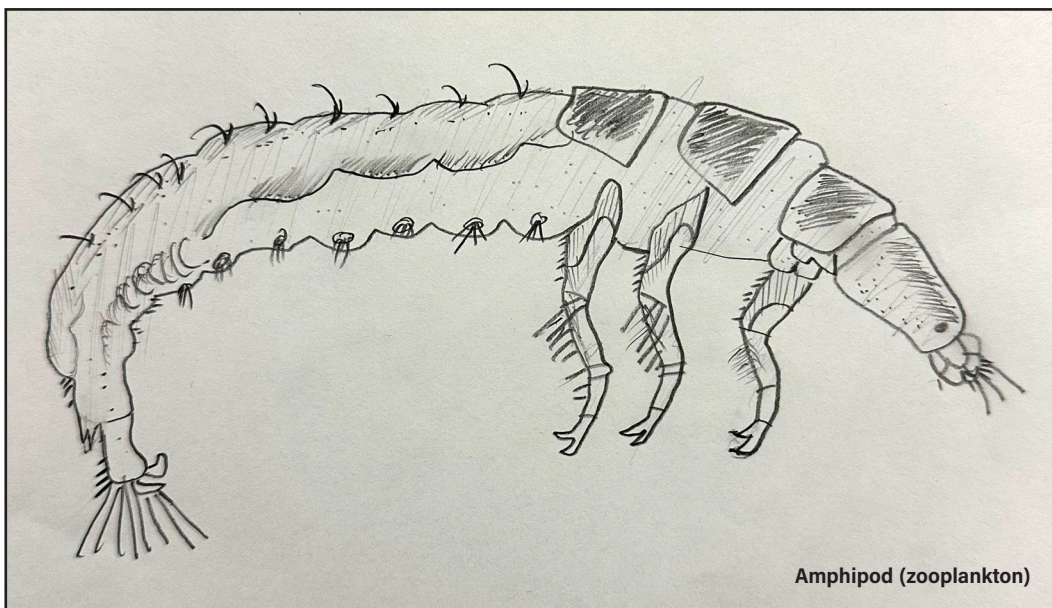
OLIVER MOREJOHN / HOMESCHOOL



ISAIAH DUGGER / HOMESCHOOL

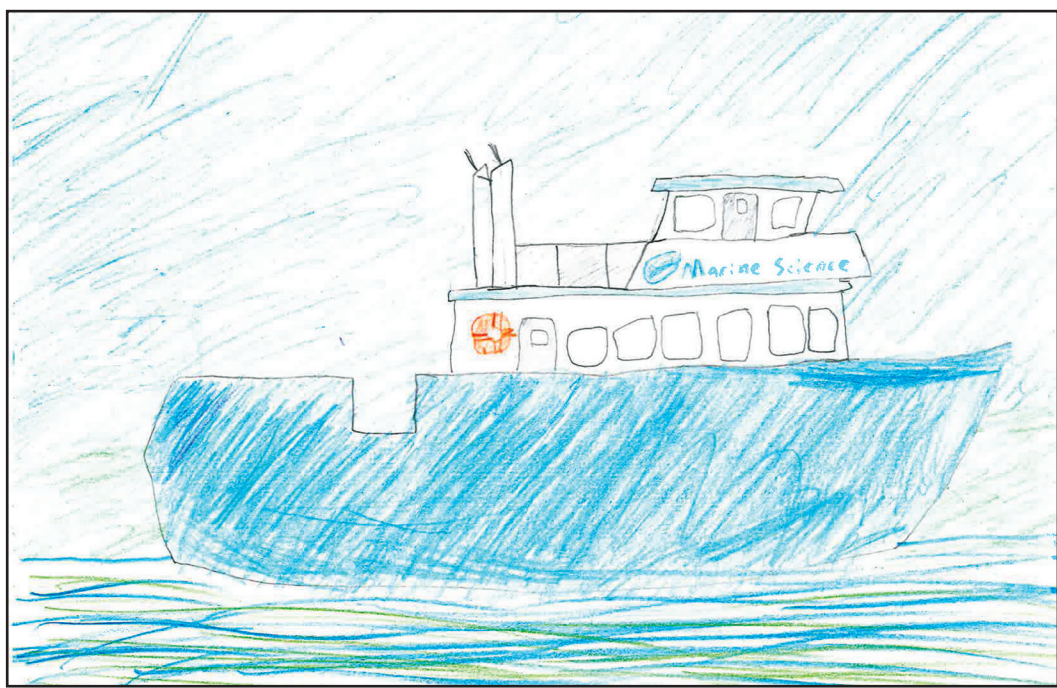


FAITH VANDER VEEN / HOMESCHOOL

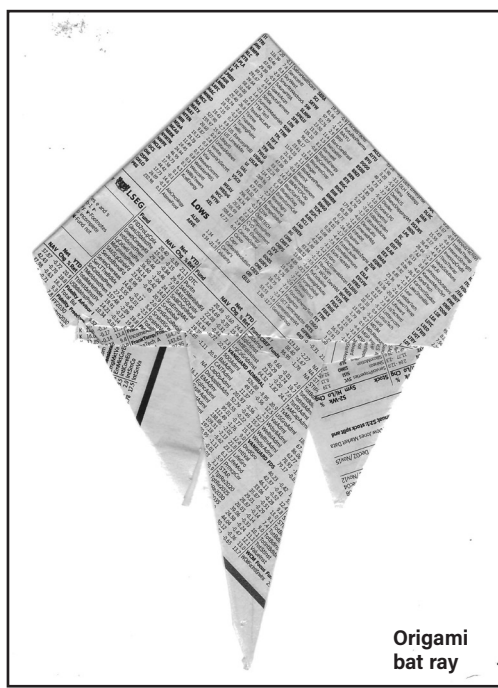


Amphipod (zooplankton)

ANGELA SOTO / WOODBRIDGE ELEMENTARY SCHOOL



BENJAMIN VANDER VEEN / HOMESCHOOL



Origami bat ray

MCKENNA MOREJOHN / HOMESCHOOL

Learning about the sea floor, or 'benthos'

Sebastian Chavez

WOODBRIDGE ELEMENTARY SCHOOL

One of the stations during the MSI Discovery Voyage was the Benthic Station.

Benthic means bottom, so this station was all about studying the organisms living on or in the sea floor (benthos).

We also learned about their interactions with the environment and the impact human activities can have on this diverse ecosystem. Human activities such as destructive fishing practices, pollution, and coastal development can all significantly impact benthic habitats.

The San Francisco Bay has an average depth of 12 to 15 feet. Using a Peterson Mud Grab, we were able to collect a sample of sediment from the bottom of the Bay. Then we explored a mud sample by touching the mud.

We discovered live invertebrates in our mud samples. Invertebrates are organisms with no backbone. Benthic invertebrates include bottom dwelling creatures like crustaceans, worms, and insect larvae. Each of these bottom dwellers are important food sources for fish, birds, and other wildlife.

We also learned that some benthic invertebrates are invasive species, which means they are not native to the ecosystem, and can cause harm to or have a significant impact on the bay's ecosystem.

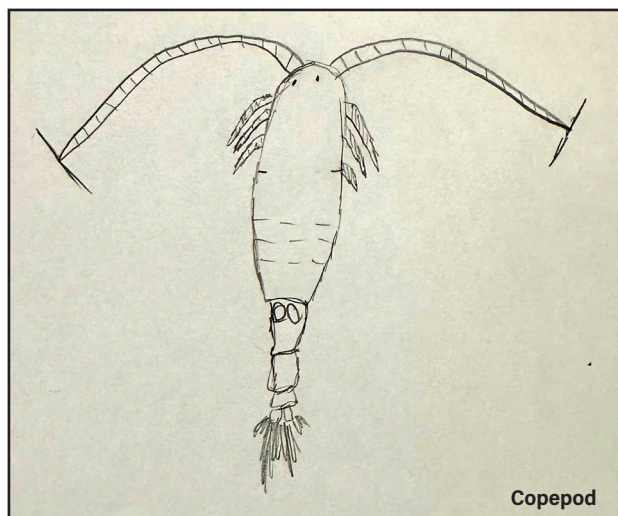
We completed this station by taking an oath to protect all living creatures in the benthic ecosystem and the Bay and signed this oath by wearing mud from the bottom of the bay on our faces.

Plankton: The microscopic drifters of the San Francisco Bay

Claire Harvie
WOODBRIDGE ELEMENTARY SCHOOL

On March 4, my sixth grade class and I were able to attend a field trip through the Marine Science Institute. We took part in the Discovery Voyage program, where my classmates and I had the opportunity to board a boat that serves as a research vessel.

While on board the boat for four hours, we were able to go out on the San Francisco Bay and perform a variety of hands-on science stations that all taught us about how what we do as humans can impact the health of the San Francisco Bay. All of the MSI workers recorded



Copepod

ALEXIA AFTIAS / WOODBRIDGE ELEMENTARY SCHOOL

the data we collected at each station and used that information to help monitor the health of the bay.

While all of the rotations were fun and interesting, I especially enjoyed learning about plankton. Plankton are

drifters that get carried through the water by currents and tides.

During the plankton station, we caught plankton from the Bay with a special funnel shaped, fine meshed net. After catching the plankton, we headed downstairs in the boat and observed a drop of Bay water under a microscope. What we could see through the microscope was projected on a large screen so we could all see what we had caught.

It was fascinating to discover how many varieties of plankton were living in just one small drop of water! While observing the plankton with the microscope we then worked together

to identify what type of plankton we caught.

My favorite was a copepod, which is the plankton that the character "Spongebob Squarepants" is based on. We also caught many other types of plankton.

Even though plankton cannot be seen with the naked eye, they are still living things that exist. Next time you accidentally drink some ocean water, think about how many plankton you're drinking!

Also, be mindful of what you can do around your city to help keep our waterways clean. These tiny plankton and other marine life can be impacted by our choices.

LIFE IN THE WATERSHED

Learning about plankton with MSI

Hui Qi Zuo
WOODBRIDGE
ELEMENTARY SCHOOL

The Discovery Voyage, which is part of the Marine Science Institute field trip, is a program where students and MSI workers collect and record data about the San Francisco Bay. They do this process by boat.

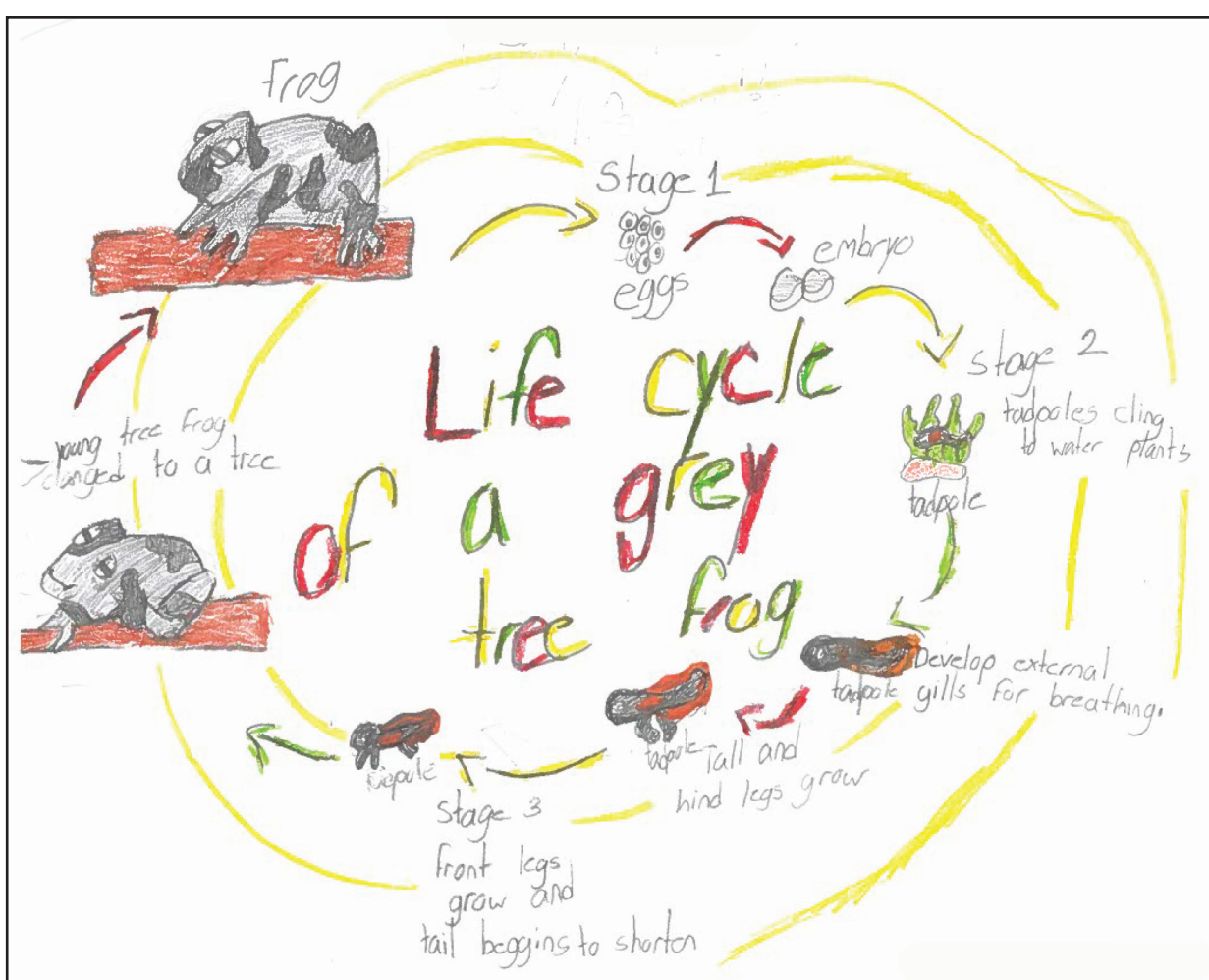
There are also stations on the boat where you can test the waters of the bay. There are a total of three stations: benthic, Ichthyology, and Plankton. The plankton station was my favorite.

First, we learned that plankton are tiny drifters in the ocean. Most are so small that people have to use a tool called a microscope to see the plankton. A microscope is a tool that does wonders for scientists and explorers because it magnifies things that cannot be seen with the naked eye. By using a

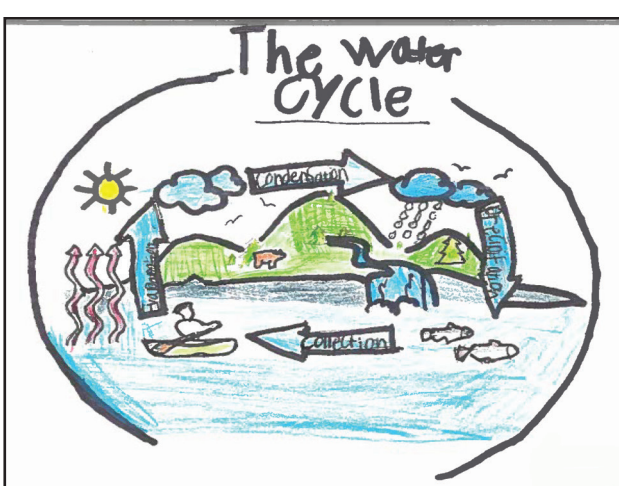
microscope, we were able to view many different types of plankton living in the bay. It was amazing how many of these tiny drifters were living in just a small drop of bay water!

We also learned that plankton comes in many shapes and varieties. Using a board that had pictures of all the different types of plankton, we were able to identify the plankton we saw using the microscope. I learned that there are two main types of plankton: phytoplankton and zooplankton. Phytoplankton are plant-like, and zooplankton are animal-like. The most common type of zooplankton that people know about is jellyfish.

MSI was a great experience and helps teach students about the importance of taking care of our waterways because the health of the bay and all of the aquatic life living there depend on it.



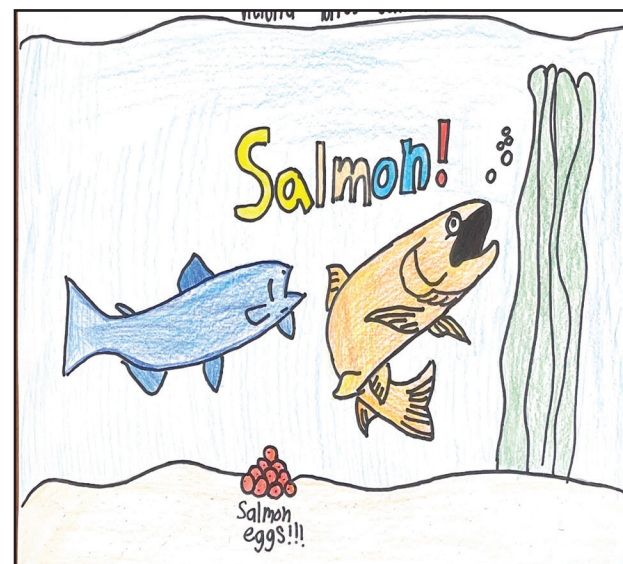
DAMIAN MENDEZ / REESE ELEMENTARY SCHOOL



MOAZZAM KHAN / REESE ELEMENTARY SCHOOL



MASON SABALBRO / REESE ELEMENTARY SCHOOL



VICTORIA TORRES CONTRERAS / BECKMAN ELEMENTARY

All about the water cycle

Moazzam Khan
REESE ELEMENTARY SCHOOL

The water cycle has four stages.

The first stage is evaporation. Evaporation happens when the water on the Earth's surface turns into a gas and rises to the air. This can happen to water in a pond, lake, stream, or water in plants.

The sun heats up the water on earth's surface. When water is heated, it turns into water vapor.

The second stage is condensation. Condensation is where clouds come from. As the water vapor rises into the earth's atmosphere it cools and turns back into liquid water.

The liquid water droplets are very small. They cling together to form clouds. Air currents high up in the atmosphere move the clouds around the globe. When too much

water has condensed, the clouds can no longer hold the water droplets in the air. They are too big and heavy. The water falls back to earth's surface in a process called precipitation. Precipitation is the third stage where water forms into rain, snow, hail, and sleet.

The last stage is called collection. Collection is the fourth and final stage of the water cycle. Collection happens when the heavy water droplets fall back to earth's surface as precipitation. Then, the droplets land in rivers, lakes, and oceans. Some water is soaked into the ground and absorbed by plant roots. Eventually, this water will evaporate back into the atmosphere and the water cycle will continue to provide a constant supply of water for life on Earth.

Salmon CROSSWORD SHEET

DOWN

- Some thing that comes from male salmon to fertilize the roe
- A river with a fish hatchery on it

ACROSS

- A species that is very important
- The name of the place where salmon lay eggs
- A young salmon
- Where the ocean meet the stream
- A type of fish
- What a salmon before they lay there egg
- Another word for egg
- A type of samlon

LAYLA LEW & JOSHUA RUIZ-GARCIA / JOHN MUIR ELEMENTARY SCHOOL

SALMON CROSSWORD PUZZLE

- A Salmon's mid stage of life.
- A 95-mile long river located in Northern California.
- the tidal mouth of a large river, where the tide meets the stream.
- A Salmon's earliest stage of its life.
- A fish known for their gruel migrations to the sea.
- One of the early stages of the fishes life.
- A phase when the Salmons life is about to end.
- A phase which is similar to around a young adult's phase.
- Mostly found in rivers, lakes, and oceans.
- a hollow in a riverbed made by a trout or salmon to spawn in.

LENA MAYO & JOSEPH ONG / JOHN MUIR ELEMENTARY SCHOOL

Salmon word search

j	r	k	c	v	y	u	i	e	b
h	o	l	f	a	t	a	o	s	v
g	e	z	r	l	r	s	p	t	c
f	x	s	y	e	r	o	p	u	l
d	r	a	b	p	e	d	j	a	k
s	e	l	q	w	f	g	h	r	x
k	m	s	a	l	m	o	n	y	z
e	s	t	y	f	r	o	r	r	n
r	e	d	d	i	u	t	y	w	m
a	p	o	a	l	e	v	i	n	q

Roe _____ Fry _____
Salmon _____ Redd _____
Estuary _____ Alevin _____

ELIZABETH ALESSIO / JOHN MUIR ELEMENTARY SCHOOL

SALMON IN THE CLASSROOM

Memories of a classroom salmon

Nickie Prasad
BORCHARDT ELEMENTARY SCHOOL

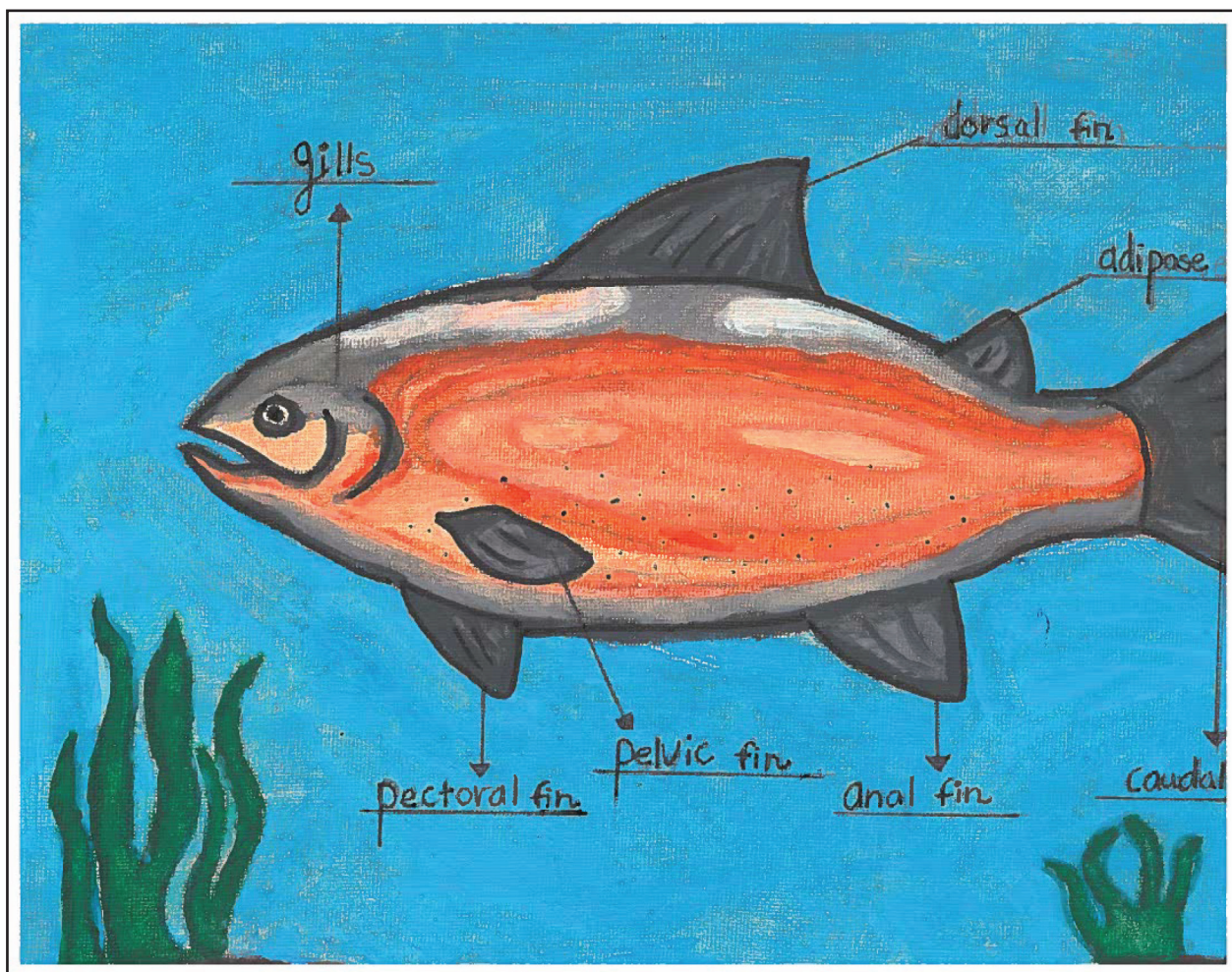
I started my life as a salmon egg. One day, a scientist brought me to a classroom. I was just a little egg when the scientist scooped me up and put me in a tank. I was scared. I was just a little orange ball

until the teacher opened the covers on the tank. I've never seen light like that before! There were twelve lights on me, some were big and some were small.

And then boom! The kids arrived! Gasp! Gulp! Now I was even more scared and one of the kids saw me hatch and started screaming! I got

so scared that when the teacher opened the cover again, I hid. That one kid though always found a way to see me.

There were other fish swimming with me but soon I will be free. I will be traveling back to the river and will make it to the ocean on time. It is going to be so much fun.



ADREA MEJIA PORTILLO / REESE ELEMENTARY SCHOOL

ACROSTIC POEMS

Salmon Poem

Abigail Mitchell
REESE ELEMENTARY SCHOOL

Swimming upstream to spawn
A wild salmon has an adipose fin and a hatchery salmon doesn't
Live in freshwater and saltwater
Migrate to the estuary before heading out to sea
Otters are a salmon predator
Not all salmon survive, only about 1 in 3000 will live

Salmon

Fern Stahlschmidt
JOHN MUIR ELEMENTARY SCHOOL

Swim gracefully in the river
Alevin are so cute and tiny
Lay their eggs in a redd
Mom makes nest in the gravel
Outstanding swimmers, they have to swim upstream
Never uninteresting

Salmon

Elizabeth Alessio
JOHN MUIR ELEMENTARY SCHOOL

Splashing everywhere
Amazing in the water
Living their best life
Magnificent before my eyes
On their way
Never giving up

Salmon

Layla Lew
JOHN MUIR ELEMENTARY SCHOOL

So amazing and helpful
A keystone species
Living and cool
Mokelumne fish hatchery reason to be built
Okay now
Nice creatures to have in a classroom

A salmon's poetic journey

Samual Garza
VINEWOOD ELEMENTARY SCHOOL

In the cold winter night bolting up stream

A salmon pushes its way up the darkened river

The moonlight shines down on its scales making them gleam

If thou jumped in this river it would sure make thou shiver

Salmon make this journey every year in order to spawn

Once this task is complete, it shall bring them to their death

As it is a sacrifice necessary for the

species to go on
When the destination is reached, the eggs get buried in the gravel depth

Traveling from the ocean up the river causes a great change

Their bodies take a beating from the rocky river bottom

The color starts at silversilver and ends in a reddish-green range

The tough challenges these salmon go through are scientifically awesome

Due to man overfishing and affecting this process

Fish hatcheries have improved the salmon population with great success

Salmon word Jumble

What sort of nuts do salmon eat?

ryf ○ ○ ○

Lsaonm ○ ○ ○ ○ ○ ○ ○

tmols ○ ○ ○ ○ ○ ○ ○

smda ○ ○ ○ ○ ○ ○ ○

edrds ○ ○ ○ ○ ○ ○ ○

a ○ n ○

RONGELENA MAYO & AREMI OROZCO-LOPEZ / JOHN MUIR ELEMENTARY SCHOOL

SALMON WORD SEARCH

By Santiago

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

Find these words:

- Gills
- Dorsal Fin
- Adipose Fin
- Pelvic Fin
- Eggs
- salmon
- Pectoral Fin
- Anal Fin
- Caudal Fin
- Fish
- Migration
- silver

HOOK LINE & SINKER

SANTIAGO VILLEGAS / REESE ELEMENTARY SCHOOL

From the Watershed

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

- | | | | |
|-----------|--------|-----------|-----------|
| ALLIGATOR | FISH | MOKELUMNE | SALMON |
| BASS | FROG | PEOPLE | SNAKE |
| BEE | GRASS | PIKE | TREE |
| CATFISH | LAKE | PLANT | TROUT |
| COYOTE | LIZARD | RATTLE | TURTLE |
| DUCK | LODI | RIVER | WATERSHED |

CAMDEN VALENTINE / REESE ELEMENTARY SCHOOL

Salmon Related WORD SEARCH



Can you find the words hidden in the puzzle? Once you find them, cross out the words you found.

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

- | | | | |
|--------|-----------|----------|------|
| SALMON | WATERFALL | SMOLT | DAM |
| REDD | RIVER | SPAWNING | ROE |
| FRY | WATER | EGGS | MILT |

RYAN UCH / JOHN MUIR ELEMENTARY SCHOOL

LIFE IN THE WATERSHED

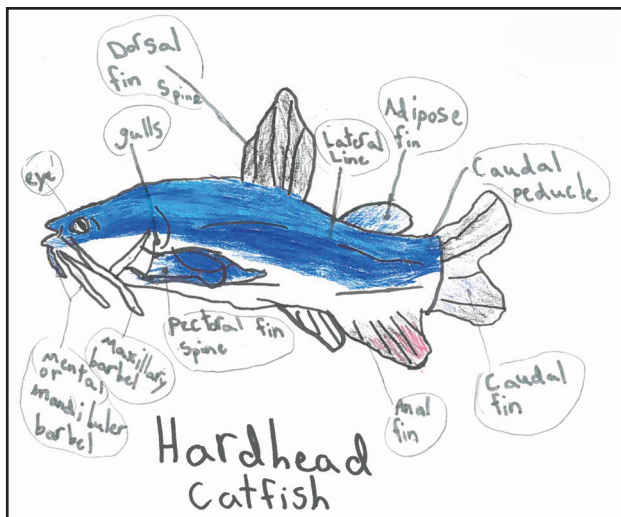
All about the Mokelumne's hardhead catfish

Piper Beltz
REESE ELEMENTARY SCHOOL

There is a lot to learn about hardhead catfish. Many hardheads are usually found in small to large streams like Mokelumne River. These fish eat benthic invertebrates, aquatic plants and algae, or insects.

Young fish typically feed on mayfly and caddisfly larvae, as well as small snails. Older fish may focus on plants, crayfish, and larger invertebrates within a stream.

Hardhead tend to like warmer temperatures than salmon and they are often found associ-



PIPER BELTZ / REESE ELEMENTARY SCHOOL

ated with pikeminnows and suckers. A hard-

head's preferred stream temperature can be more

than 20 degrees Celsius, though these fish do not like low oxygen levels in their water.

Females usually lay 7,000 to 24,000 eggs every year. Some fish biologists believe that the eggs may take two years to make within a female.

Adult hardheads can live up to 9 or 10 years old. They weigh about 12 lbs and can be 28 inches in length. Hardheads are usually dark brown to dark blue with a lack of scales. Actually the hardhead will sting. If you do get stung, a puncture will be followed by severe pain and swelling. Hardhead catfish are the best.

ACROSTIC POEMS

Western Pond Turtle

Eloise Brodehl
REESE ELEMENTARY SCHOOL

Tough shell
Underwater or on land
Returning to lay their eggs
Turning into a juvenile after hatching
Living between 10-150 years
Encased in the summer

Salmon

Greycin Abong
JOHN MUIR ELEMENTARY SCHOOL

Slithering through the sea, how grand can that be.
An aquatic, never chaotic.
Light in the lake, for our sake.
Many, not hardly any.
Oceanic, not to panic.
Natural, not man made, don't be afraid.

Redd

Celine Chan
JOHN MUIR ELEMENTARY SCHOOL

Remaining ever so
Esoteric in
Delightful fresh water that
Dazzles and shines in the moonlight

Water Poem

Ethan Neeley
REESE ELEMENTARY SCHOOL

When baby Chinook salmon are born they have bellies under their stomachs and they are in the alevin stage.

Around the world there are many native fish species.

To many fish, having a lateral line is normal. Ecosystems. Wow, every fish, human, plant, animal and living thing has ecosystems.

Routes — secret routes are in every watershed including ours.

Salmon

Mannat Birring
JOHN MUIR ELEMENTARY SCHOOL

Spawning and
Also Anadromous
Life from and they put
Milt from male fish
On eggs so that they are fertilized and I hope
Nobody hurts them

Mokelumne

Quynh Le
JOHN MUIR ELEMENTARY SCHOOL

Migrating to the ocean
Outside, the Salmon float
Keystone species
Ecosystems are affected by salmon
Lakes are where they were born at
Under gravel is where the roes are
Many salmon migrate
Never catch salmon during spawning time
Enjoy the water

Salmon

Norah Dietrich
JOHN MUIR ELEMENTARY SCHOOL

Superb when they're just eggs
Awesome still when they jump
Lovely swimmers, and providers of many rivers
Marvelous jumpers, up to 12 feet in the air
Opalescent is the color of their bodies swimming through the water
Never even afraid of what lies ahead in this long challenging game

Waterway

Alyssa Flores-Jaramillo
JOHN MUIR ELEMENTARY SCHOOL

Wetness fills a space, holding life and importance.
Anywhere and everywhere, fish pass.
Time and time again, trash gets thrown into water.
Eventually it will kill animals, making harmful environments.
Recycle your trash so we can have clean rivers with clear ripples.
When we all do our part, the world can be a better place.
A safe planet leads to safe species and overall happiness!
You don't want to be the one to ruin that, do you?

Ecosystem

Joseph Ong
JOHN MUIR ELEMENTARY SCHOOL

Eggs lay in the water
Coming back to their birth place
Outside looking at nature
Smolt is a stage of a salmon
Years of life
Swim to the ocean
Turf at the bottom of the ocean
Enjoy the view
Mokelumne River

Salmon

Aubrey Phan
JOHN MUIR ELEMENTARY SCHOOL

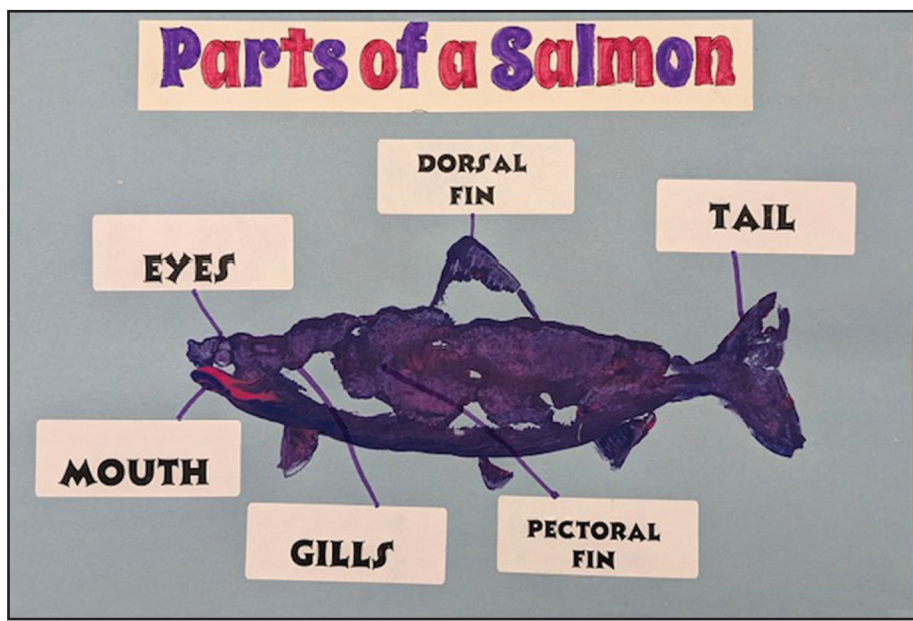
Spawning stage is first,
Alevin next.
Leaving their home stream.
Milt is the liquid male salmon use to fertilize the eggs.
Over the fish ladder!
Now to the Mokelumne River Fish Hatchery.

Test your knowledge with this salmon quiz

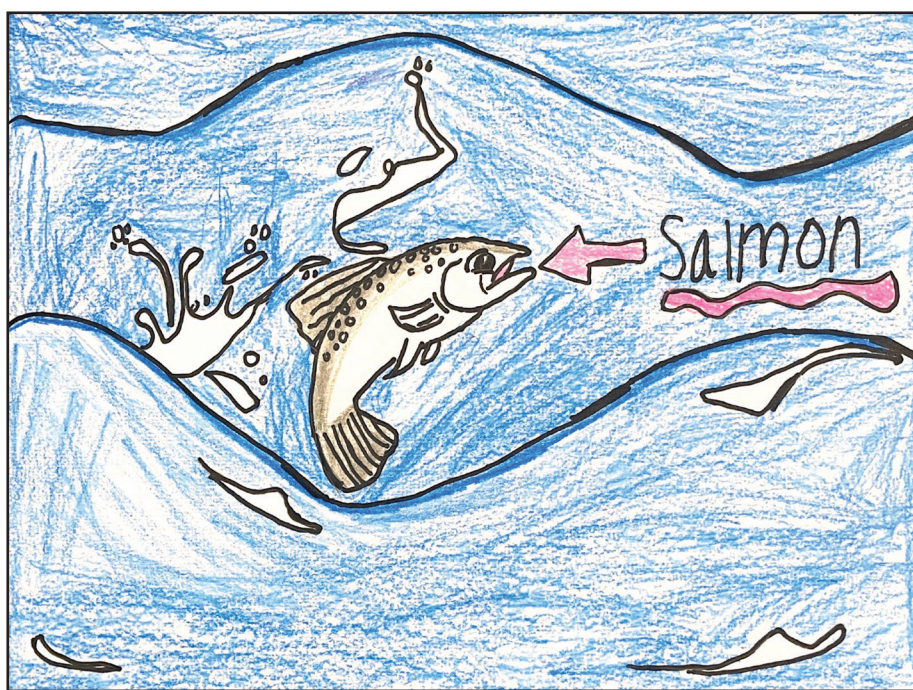
Max Engert
REESE ELEMENTARY SCHOOL

1. What is the name of the fin that salmon don't really need to survive?
A. Adipose fin
B. Dorsal fin
C. Pectoral fin
2. Complete the life cycle.
Egg-alevin-fry-
-adult
3. What is the large back fin on a salmon called?
A. Pelvic fin
B. Dorsal fin
C. Anle fin
4. What structure do salmon have that act as an antennae?
A. Lateral line
B. Gills
5. Salmon have teeth in their gills.
A. True
B. False

Answers:
A, Smolt, B, A, A



AIZA MEHMOON / BECKMAN ELEMENTARY SCHOOL



ISABELLA BARRIGA MENDOZA / LAKEWOOD ELEMENTARY SCHOOL

Kit foxes thrive in the Mokelumne watershed

By Adelaide Cady
REESE ELEMENTARY SCHOOL

Here are some fun facts about kit foxes.

Kit foxes eat birds, reptiles and even insects! Unlike the gray fox, kit foxes are creatures of the night.

Kit foxes avoid heat stress during the day by remaining inactive in

underground dens. Night time foraging seldom takes a fox more than 3 kilometers from its den.

A kit fox's lifespan is 5.5 to 12 years! The kit fox is a carnivore.

Did you know that the population size is unknown? Their ears are really tall. The kit fox is part of the dog family. These are the facts.

HATCHERY

Continued from Page 1

The pens are placed where the Mokelumne River meets the San Joaquin River, which is far enough into the Delta to keep the fish away from predators. This will help the fish survive better once they leave the pens.



The fish are released in sections, each two days apart. This keeps predators from finding where the fish are being

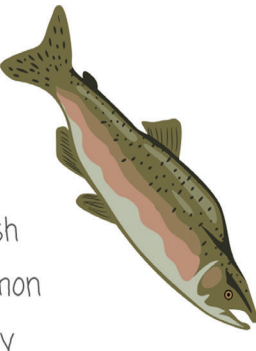
released and going there for a free meal.

These methods are what make the Fish Hatchery so successful. Every step of the process helps the fish survive.

From starting as eggs to growing fish, the hatchery helps the salmon live to start the cycle over again.

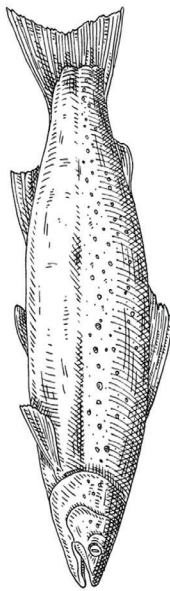
This gives the Mokelumne River Fish Hatchery one of the highest success rates in California.



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

Fish
Salmon
Fry
Smolt
Redd
Milt
Alevin
Dam
Estuary
Ecosystem
Anadromous
Sac Fry
Eggs Roe



SAMUEL PERAZA / JOHN MUIR ELEMENTARY SCHOOL

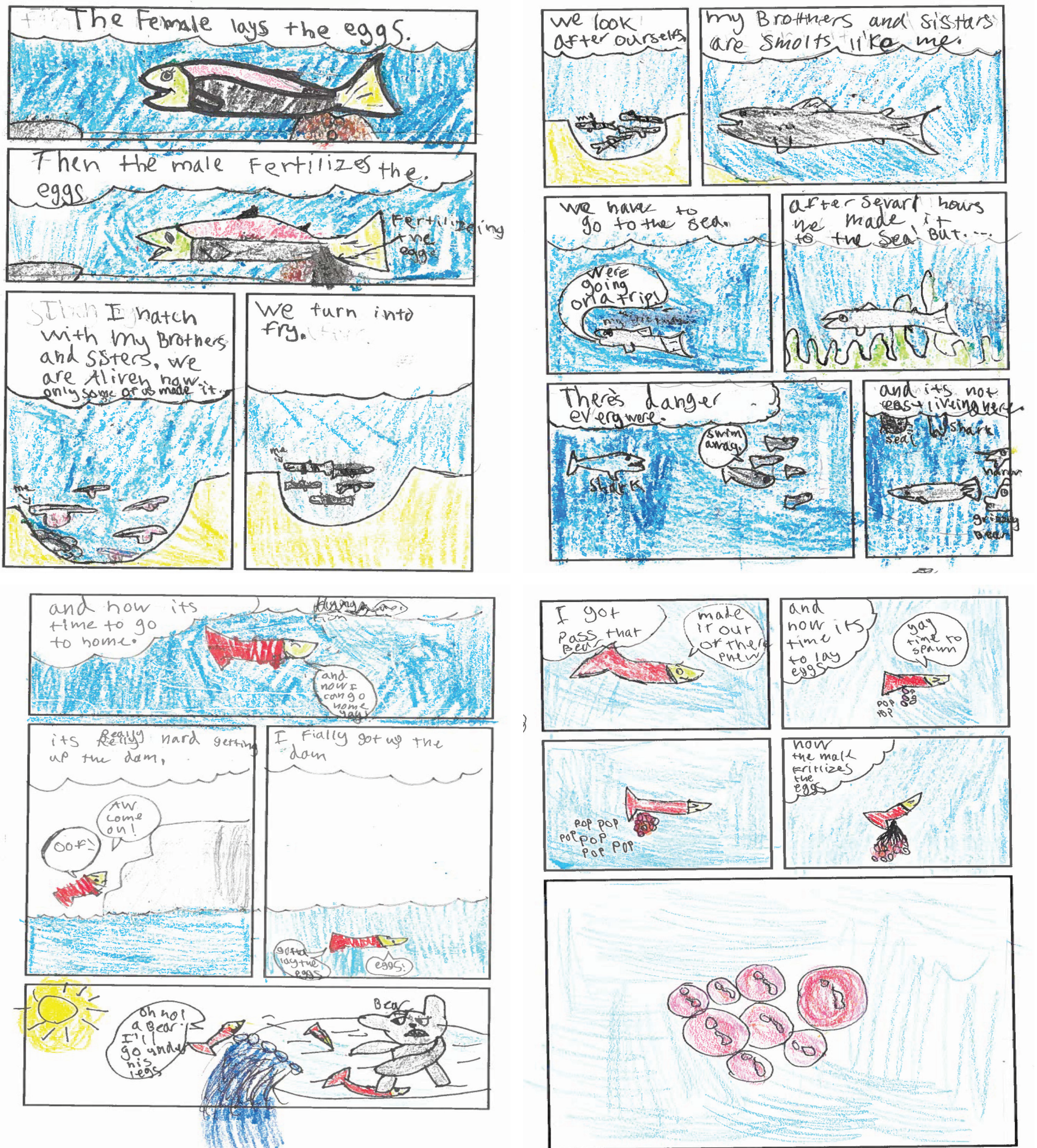
SALMON IN THE CLASSROOM

Lakewood Elementary School release their salmon



LAKWOOD ELEMENTARY SCHOOL

A Salmon's Life



ELKE KRENGEL / REESE ELEMENTARY SCHOOL

Oakwood Elementary School's salmon banner



OAKWOOD ELEMENTARY SCHOOL

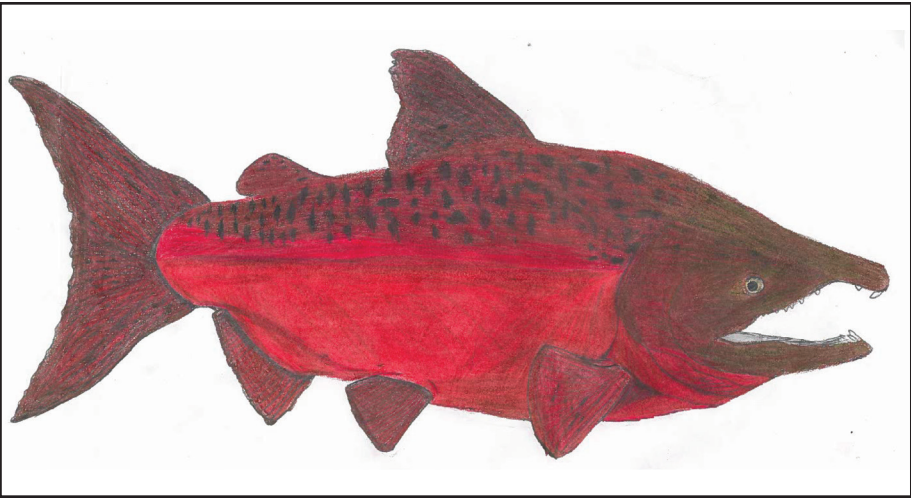
WHAT IS



A program to support literacy and civic education in the community by providing newspapers to schools throughout Lodi.

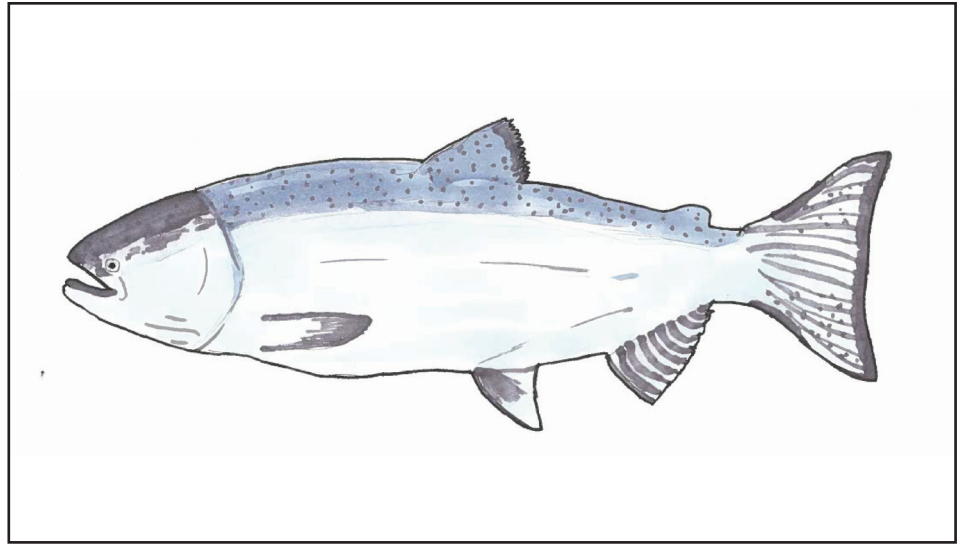
NIE provides these learning tools at no charge to the teacher, student or parent.

WILD ART



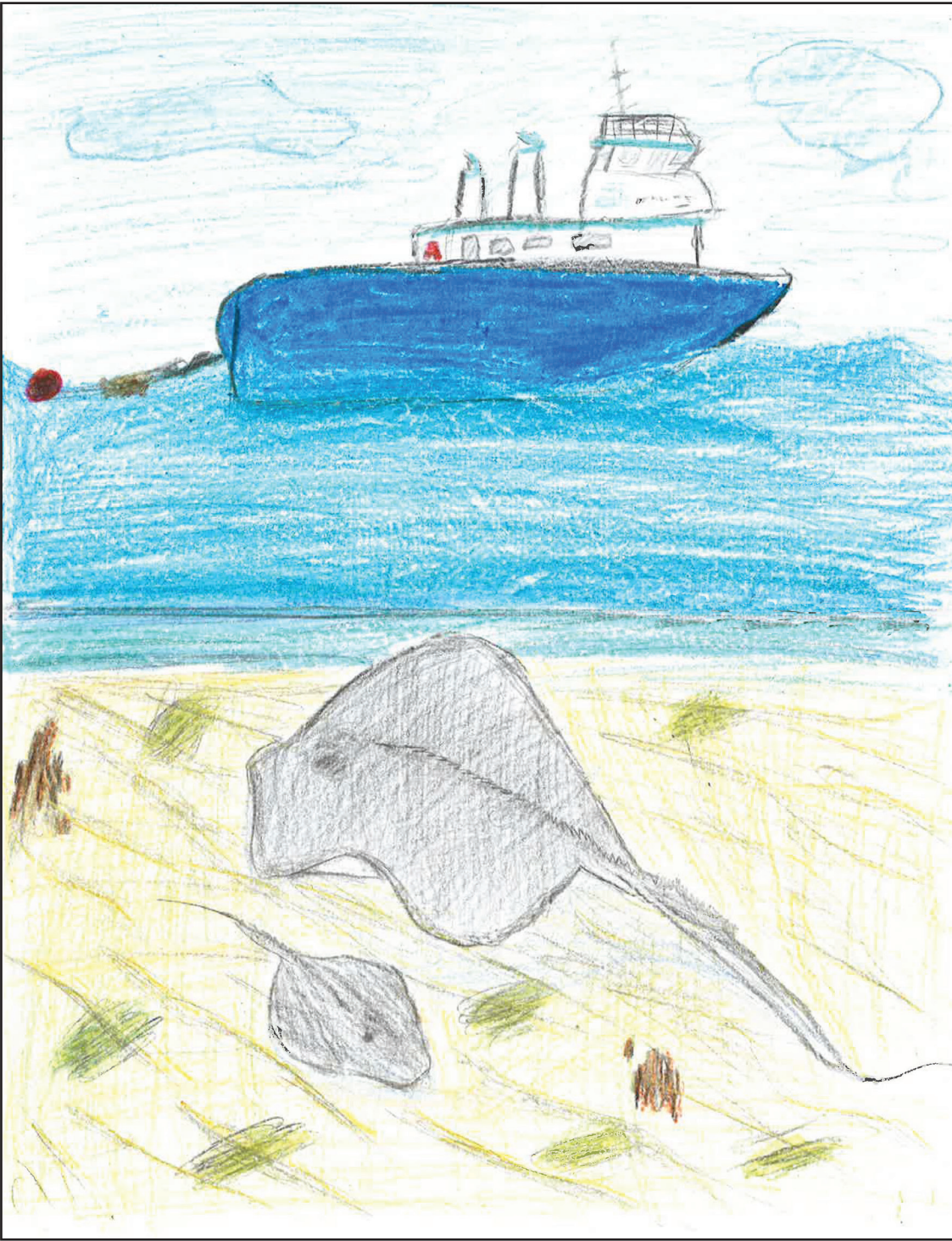
AMORIENA HERRERA / MILLSWOOD MIDDLE SCHOOL

A male salmon has a more noticeable jaw with the upper jaw being hook-shaped. A returning salmon seems to have more spots and also is red compared to the salmon living in the ocean, because the one in the ocean has less spots and is silver.



KATIE LESTRANGE / MILLSWOOD MIDDLE SCHOOL

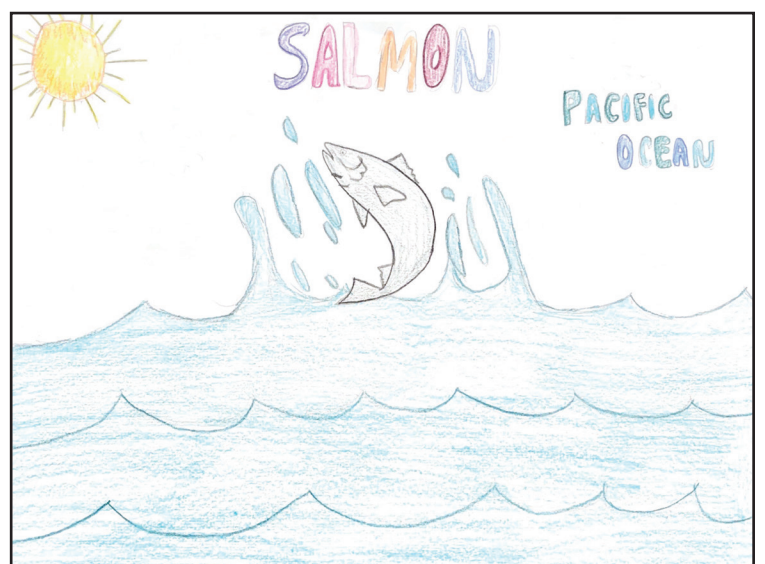
Returning salmon are silver. Male salmon have a long snout and sharp teeth.



ARIELLE DUGGER / HOMESCHOOL

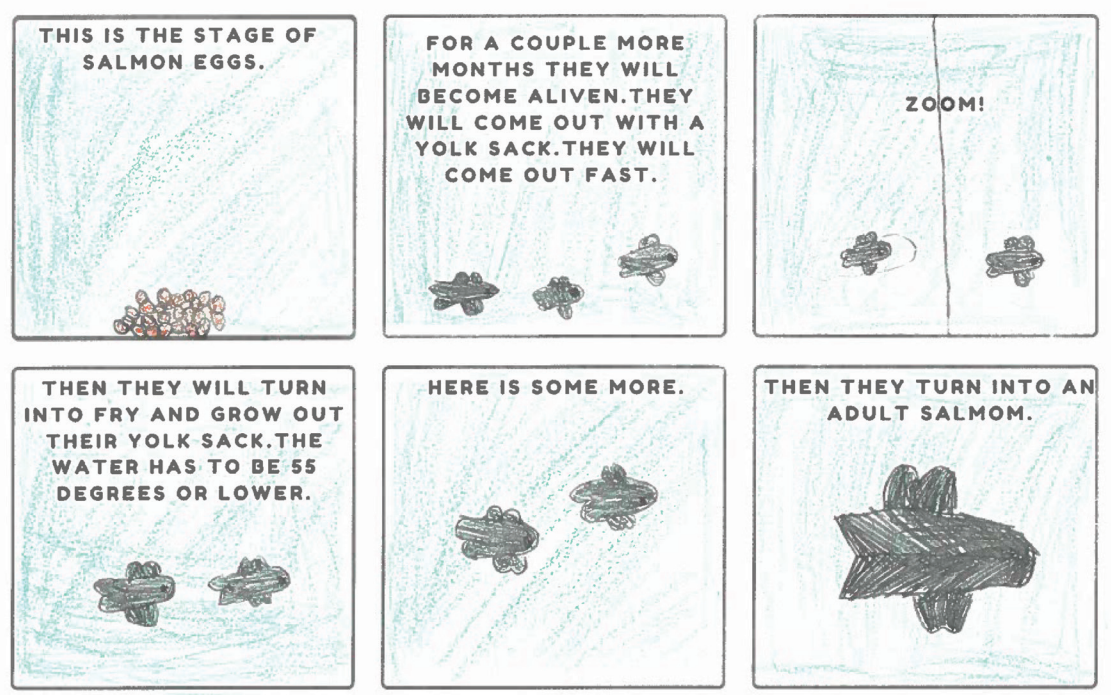


MALINA CASTRO PEREZ / LAKEWOOD ELEMENTARY SCHOOL

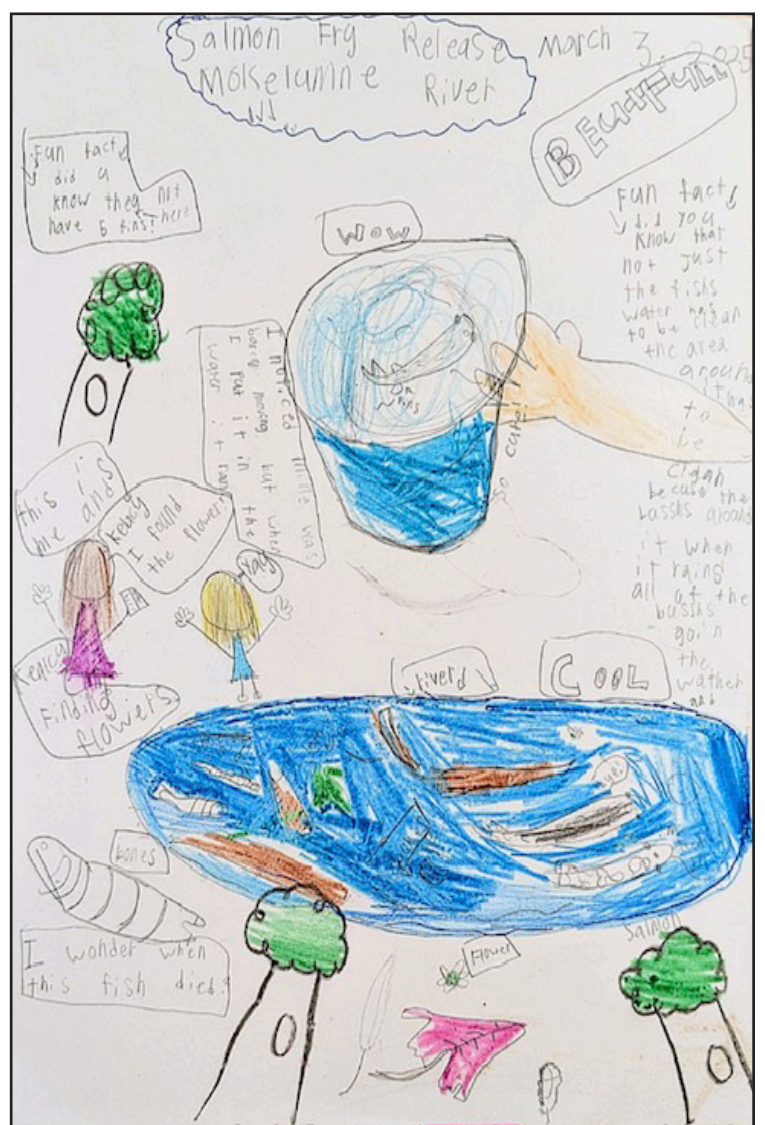


ROSELYN BUCIO CHARCO / LAKEWOOD ELEMENTARY SCHOOL

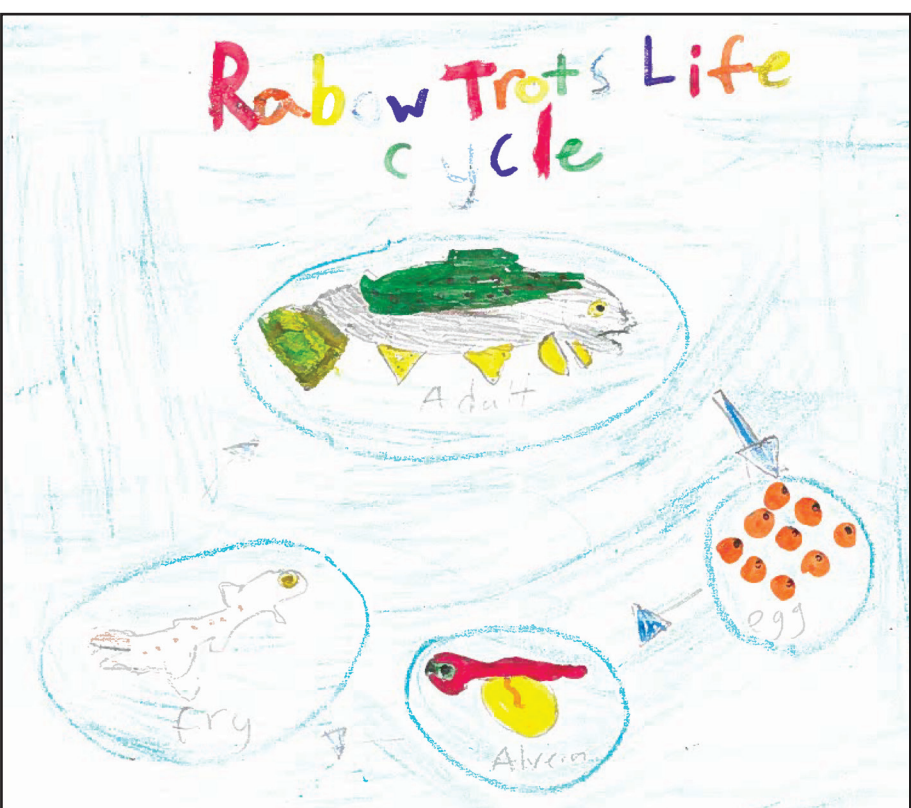
STAGES OF A CHINOOK SALMON



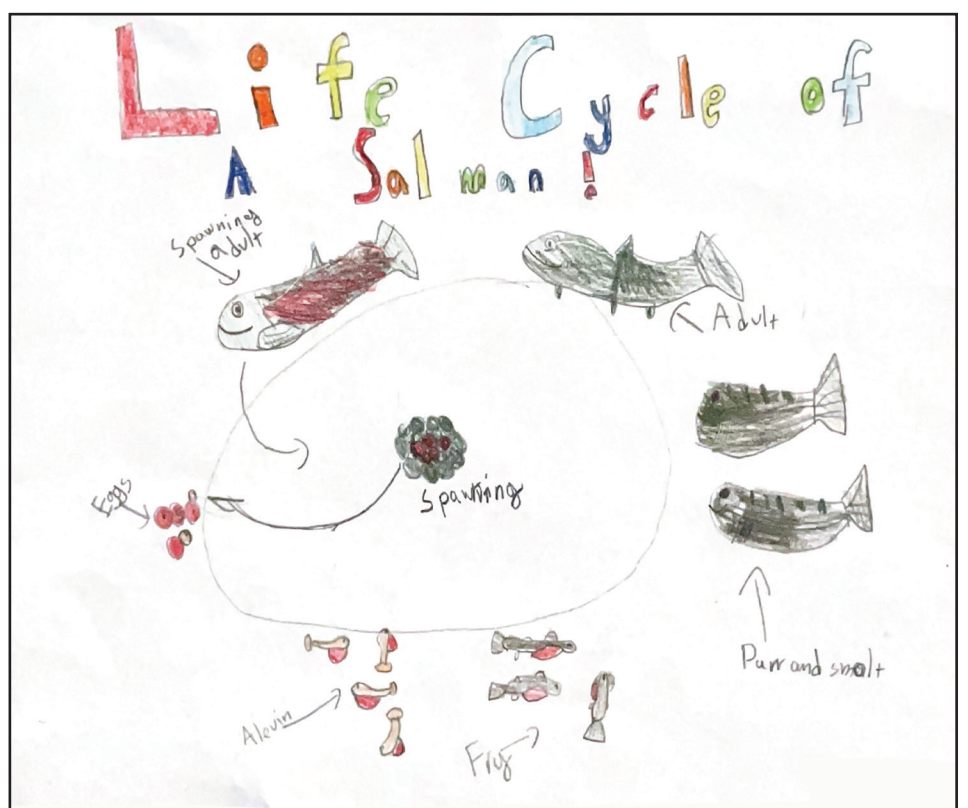
SOPHIA KHOURY / REESE ELEMENTARY SCHOOL



NATALIA LOPEZ / BECKMAN ELEMENTARY SCHOOL



KIERSEN LANCASTER / REESE ELEMENTARY SCHOOL



JUNE CAMPBELL / LAKEWOOD ELEMENTARY SCHOOL