

FRENCH CREEK MYSTERIES



KRISTY GARCIA



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WRITTEN AND ILLUSTRATED BY: KRISTY GARCIA

About the Artist:

Kristy Garcia grew up on the coast in Rockland, Maine, where she grew to love the outdoors. She attended the Maine School of Science and Mathematics in northern Maine and then continued her passion for science at Allegheny College. As a student and artist she esteemed to bridge comics and science to inspire other nature explorers to learn more about the natural world around them. In Northwest Pennsylvania she has combined her experience as an Environmental Science major and Art minor with other experiences at Allegheny to promote the preservation of our natural resources.

In Cooperation With:

This comic was made possible by support from Creek Connections. Founded in 1995, Creek Connections utilizes citizen science to involve kids grades k-12 in water quality analysis and watershed education. The group currently serves as more than 40 different schools both in the U.S. and abroad.

The comic has also been primarily supported by academic fields at Allegheny. Many thanks to professors in the Art and English departments which encouraged, critiqued, and and improved the development of this comic.





CHAPTER 1



So this is my first year in Middle School. The school is new, but luckily my best friend is in most of my classes...

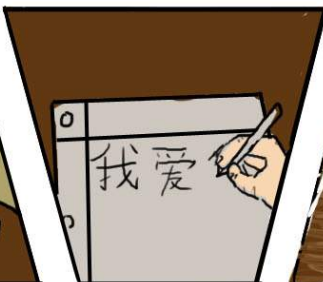
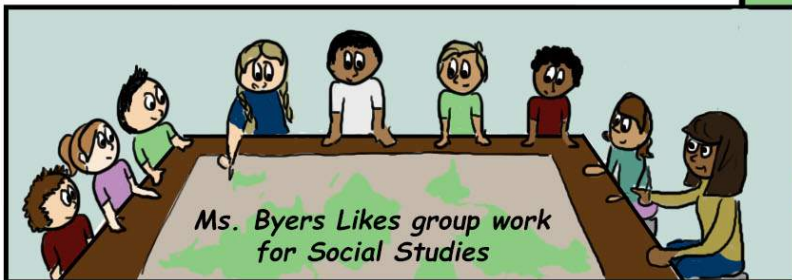
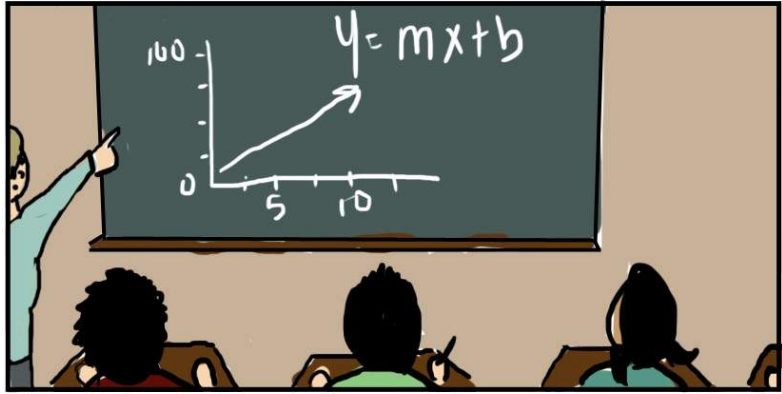


Also, the schedule is usually the same so each day I'm getting the hang of it...

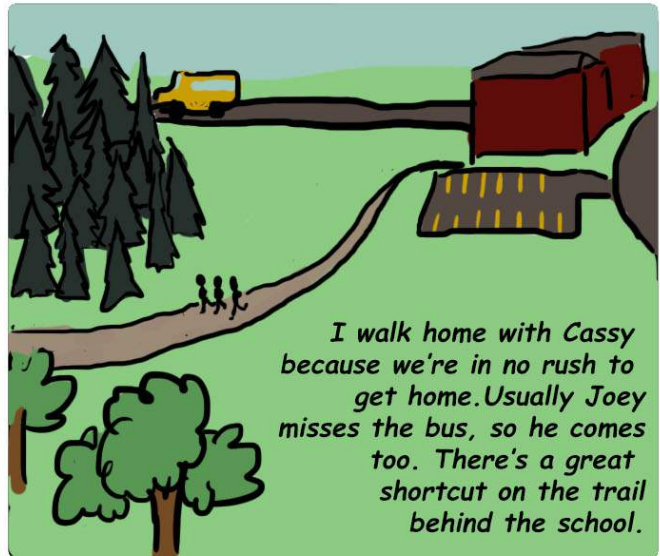


I have chorus, but my friends are mostly in band





And then we pack up

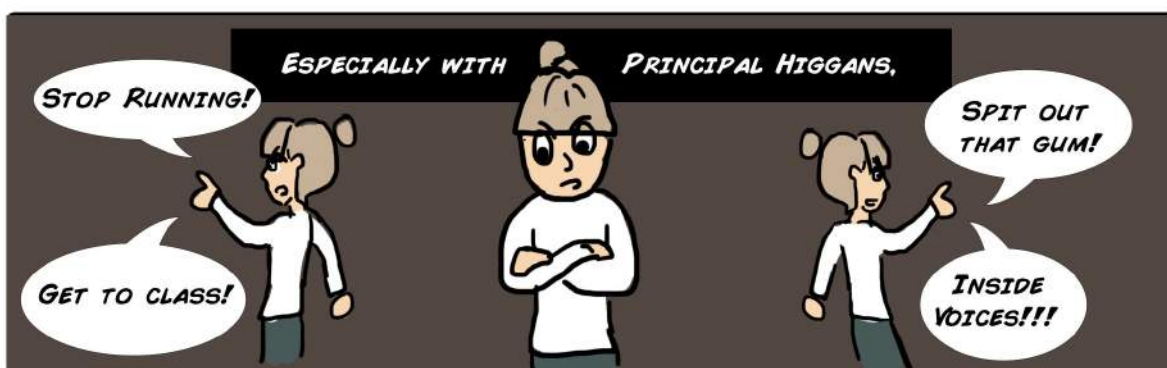


And that's usually how every day goes...





SOMETIMES WE WOULD HAVE HICCUPS ALONG THE WAY..



BUT FRIENDS MAKE IT WORTH WHILE....



IN STREAMS NEAR YOU!

Feature Creature! Crawfish, Crawdad, Crayfish

Range: widely distributed but not often found in the Rocky Mountain Region

Food: herbivores carnivores, detritivores, or omnivores

Life cycle: 10-150mm, hatch from small eggs and molt several times before looking like an adult.



Fun Fact: These critters make great fishing bait, not to mention taste delicious!

NOTE: These are not little lobsters, although, they do look quite similar. Lobsters are typically larger, and live in saltwater, unlike their small crayfish friends who prefer freshwater.

WANTED!!

Pollution intolerant Creek Critters. If found, record, leave undisturbed, and continue to protect the stream. Be on the lookout for the following creek critters:



Riffle Beetle
Stoneflies
Caddisflies
Mayflies



WOW!

Dragonflies aren't always cute.. Infact! They're a little horrifying for a good part of their lives. These are the life stages of this familiar macroinvertebrate:



No Fishing Pole Needed!

The fishing spider is so cool that it can go fishing for its prey (food) without a fishing pole! Instead, they just chill out on the shore and dangle two legs in the water. They wait to feel ripples in the water to sense where something has landed. Two legs allows them to calculate the direction as well as the distance and size of the disturbance in the water.



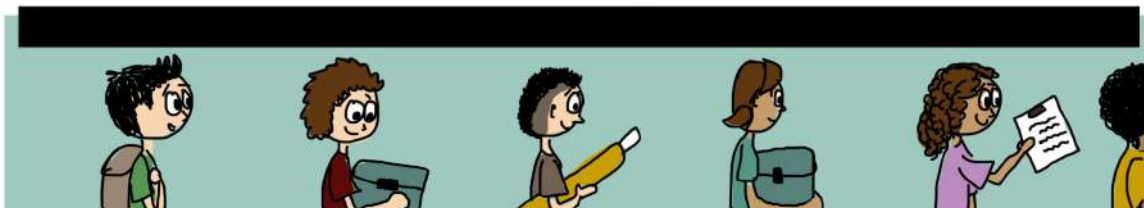
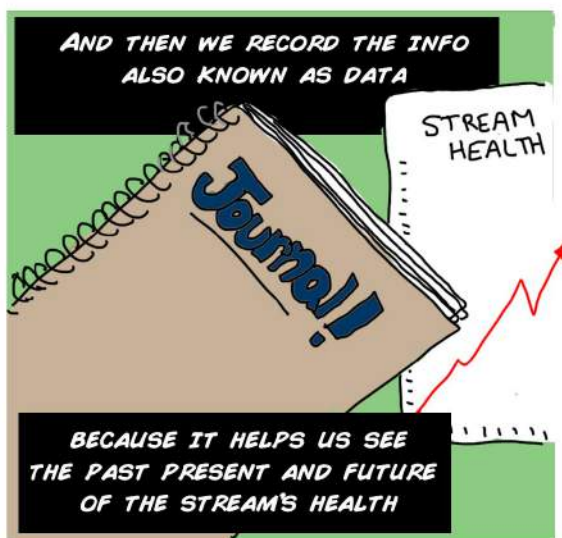
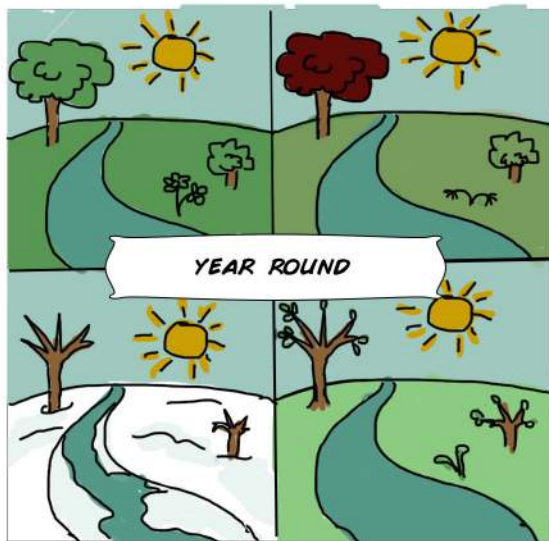
Do You Have a Creek Advertisement?

Send it to us, and maybe you'll be featured in the next issue of French Creek Mysteries!

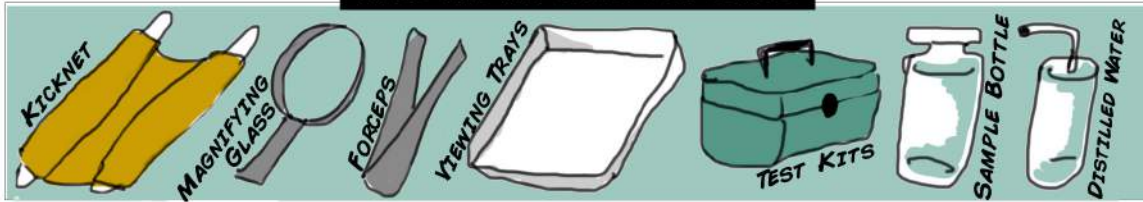
SO ALWAYS BE ON THE LOOKOUT!



Chapter 2



THESE ARE THE TOOLS YOU'LL NEED



POLLUTION

- Chemicals
- Dirt
- Trash
- Bacteria



POLLUTION INTOLERANT

Finding critters that don't like pollution means that the stream doesn't have much pollution.

You may know these critters:

- Mayfly
- Stonefly
- Water Penny



SLIGHTLY TOLERANT

These guys put up with some pollution, but can be sensitive to certain types of pollution

- Crayfish
- Dobsonflies
- Crane flies



POLLUTION TOLERANT

Finding critters who don't mind pollution means that there may or may not be a lot of pollution in the stream.

You may know:

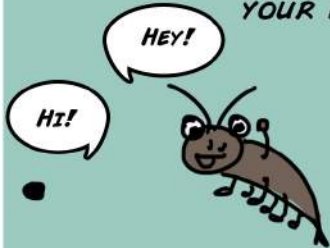
- Leeches
- Aquatic Worms
- Snails



TODAY WE'LL BE LOOKING FOR MACROINVERTEBRATES.
CAN ANYONE GUESS WHAT THAT MEANS?



"MACRO" MEANS BIG
ENOUGH TO SEE WITH
YOUR EYES



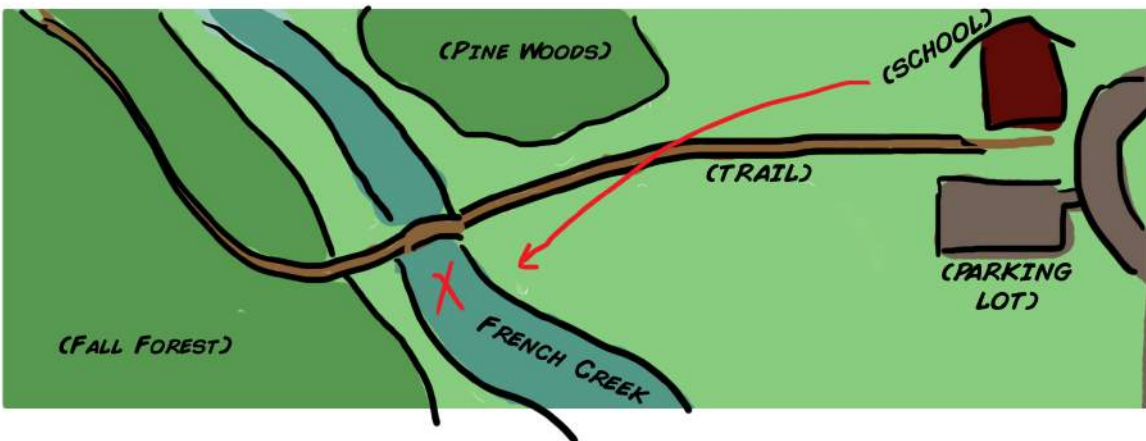
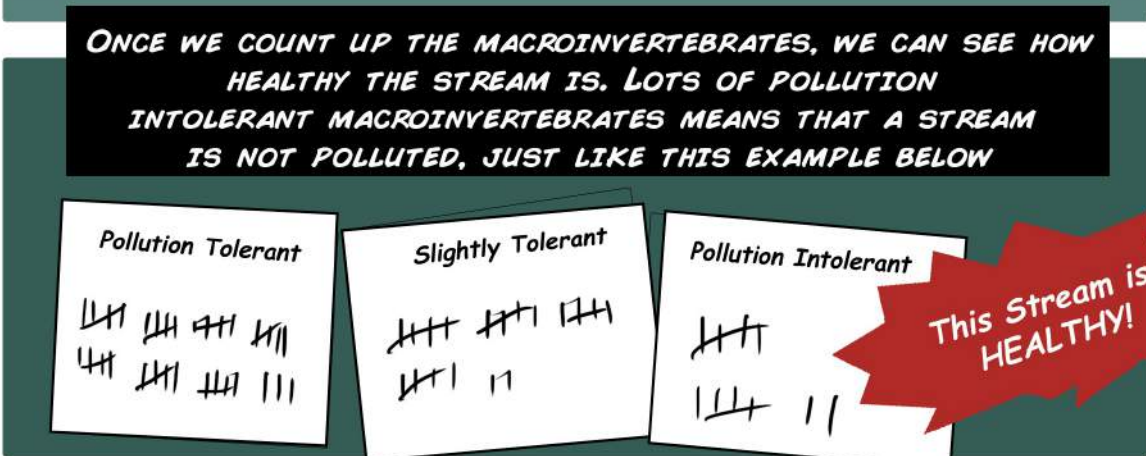
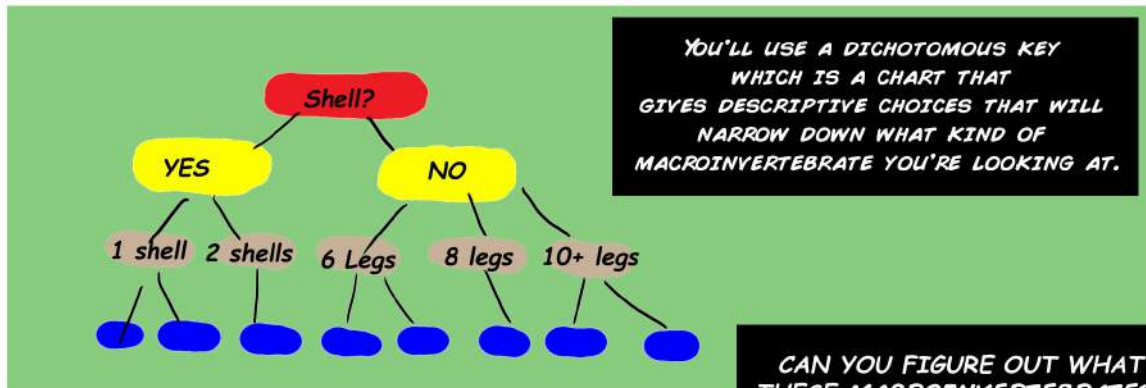
"Invertebrate" means that they
don't have an internal skeleton



YOU'LL HAVE TO LOOK HARD FOR THEM BECAUSE THEY'RE GOOD HIDERS



FILL THE TRAY WITH WATER, AND ROCKS AND LEAVES, THEN LOOK CLOSELY

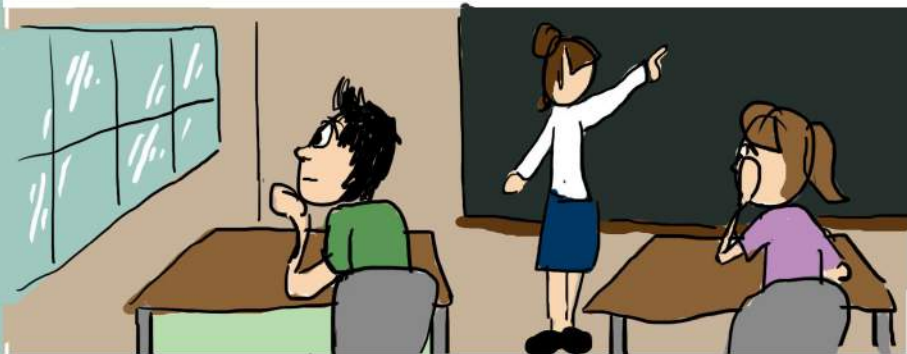




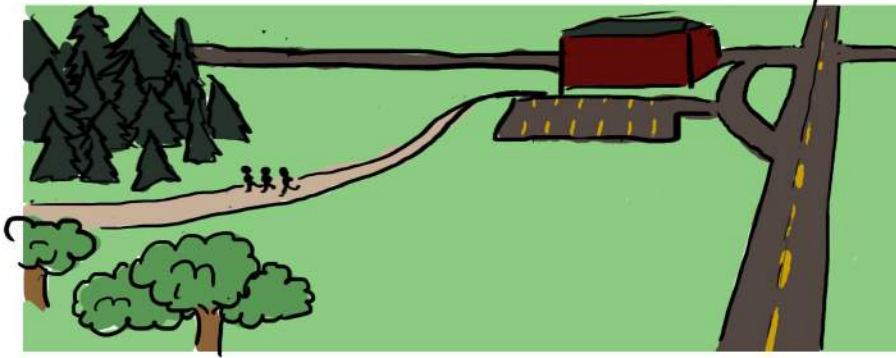




**NEXT MONTH: CHEMICAL TESTING
UNTIL THEN, WE HEADED BACK TO SCHOOL
FOR THE REST OF THE DAY**



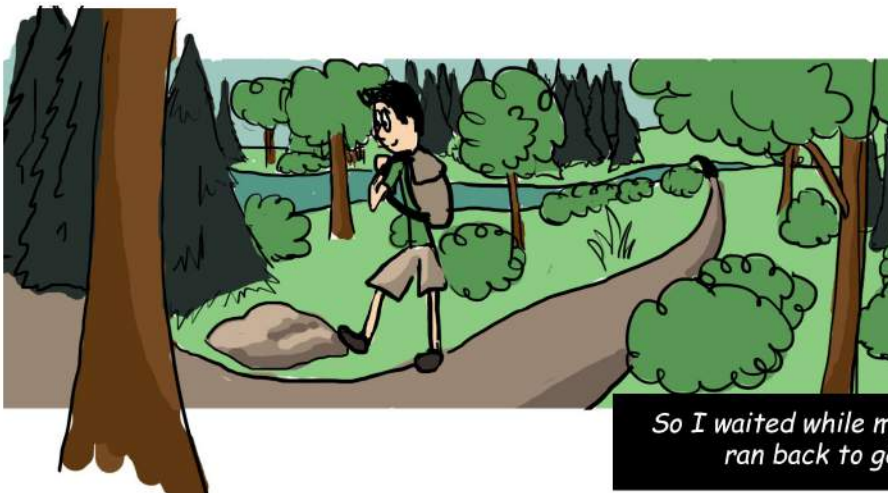
**EVERYONE WAS STILL PRETTY EXCITED,
EVEN BY THE END OF THE DAY**



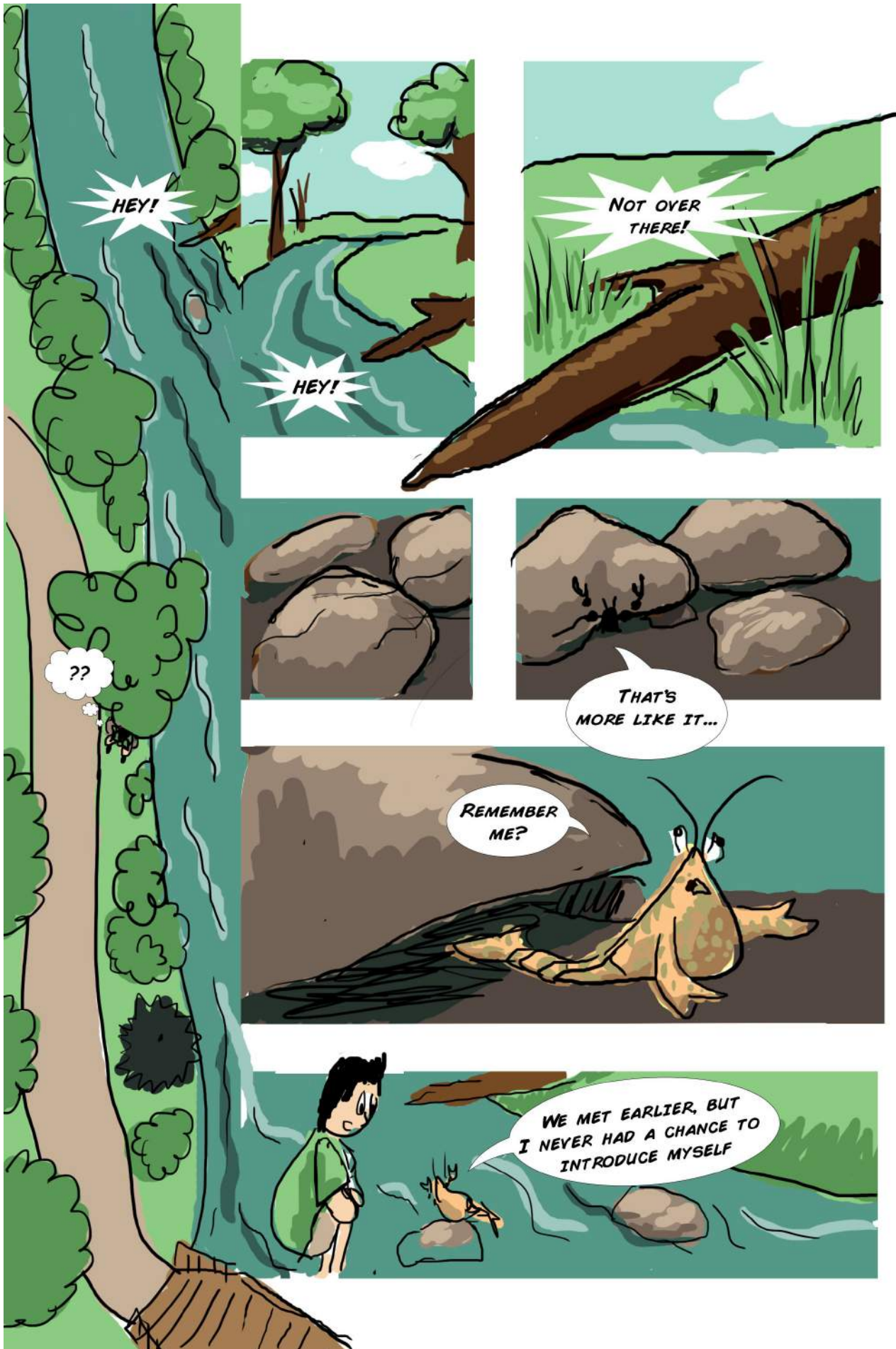
WHICH IS PROBABLY HOW JOEY
MISSED THE BUS. GOOD THING HE DIDN'T MIND

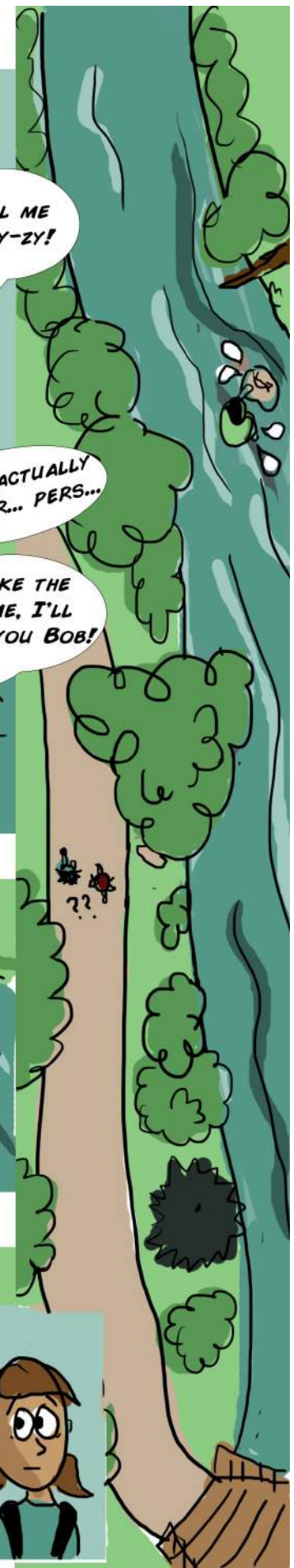
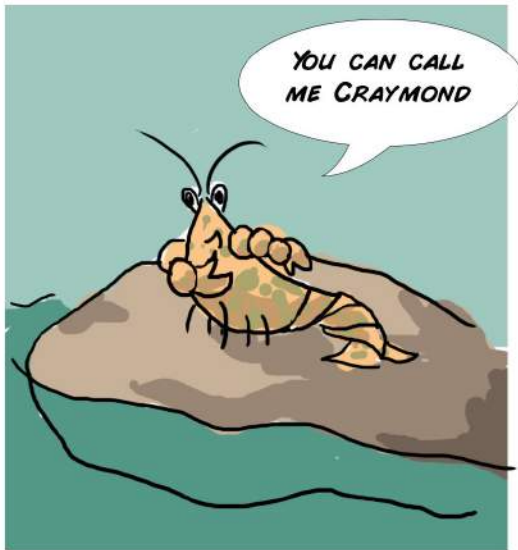


WE GOT ALL THE WAY TO THE BRIDGE
WHEN HE REALIZED HE
FORGOT HIS HOMEWORK THOUGH



So I waited while my friends
ran back to get it





IN STREAMS NEAR YOU!

Feature Creature!

Whirligig Beetle

Range: Found in swamps, ponds, bogs, lakes, streams, and rivers in North America

Food: Scavengers for detritus and dead critters

Life cycle: 3-18mm, hatch from eggs, grow from pupa stage to larva stage to adult stage.



Fun Facts: When scared, these macroinvertebrates release a chemical odor to ward off predators. People say it smells like apples. They also carry an air bubble in their abdomen to use to breathe when underwater.

Note: These critters receive their name from their knack for swimming in circles on the surface of the water, although they can swim underwater, and sometimes can fly.

Jobs Jobs Jobs

Would you like a career where you would spend most of your day in the creek like these kids?

The following jobs might be right for you!

- Fish and Boat Commission
- Biologist for the DEP or EPA
- Field Analyst or Technician
- Stream Surveyor
- Environmental Consultant

Can You Tell the Difference?

Pouch(or Tadpole) Snail

Opens to the left
eats diatoms,
detritus &
algae



Gilled Snail

Opens to the rightside
eats algae, diatoms, & detritus



SWAG SOLD HERE

Are you sick of your drab fashion?

Are you looking for some unique jewelry? Well we have some fine icing for you!

Our quality jewelry is made from only the finest caddisflies. These flies were home grown in Pennsylvania to create shells that make great accents for any outfit. These pieces come in a variety of shapes, sizes, colors, and prices. They make great gifts for friends, too!



Inquire at

BugsyArt.com or give us a call at
1(800)555-BUGS

or

1(800)555-2847.

We can supply you with jewelry quotes, or tours to meet our caddisfly friends hard at work.

MISSED AN ISSUE???

We probably have it. Give your request to your teacher or contact us at Creek Connections. We're located on Allegheny College's campus.

You can contact us by snailmail at:

Wendy Kedzierski
520 North Main St.
Meadville, PA 16335

or by the superweb at: creek@allegheny.edu

Be sure to leave your name, school, and grade and we'll get back to you ASAP.

SO ALWAYS BE ON THE LOOKOUT!



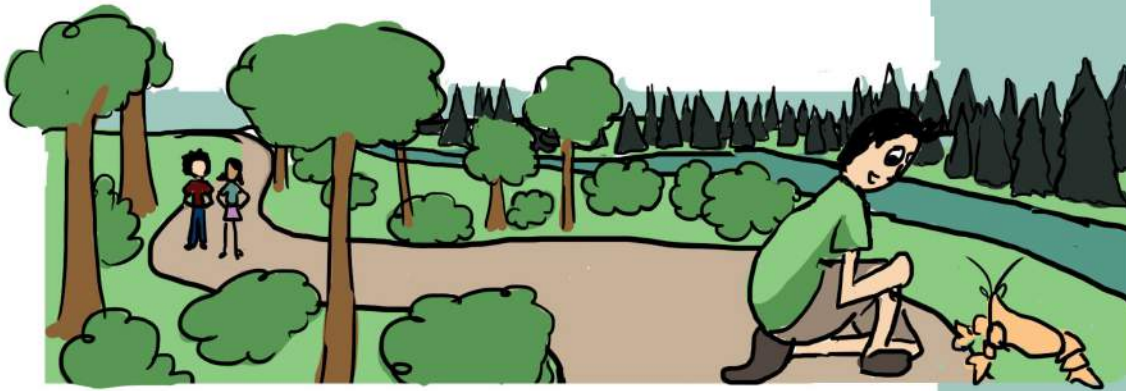
CHAPTER 3

Once a week
for the next month
we did Macro testing
with Mr. Walters



But we didn't see
Craymond during
our class visits
though





It took a while for Craymond to warm up to my friends,



We figured it was a trust thing....



You see, the creek started experiencing some changes...

AN ODD FOAM
BEGAN TO GROW...

FINALLY IT WAS TIME
FOR CREEK CONNECTIONS
TO COME BACK. WE HOPED
THEY COULD HELP...

- DISSOLVED OXYGEN
- PHOSPHOROUS
- NITROGEN
- TOTAL DISSOLVED SOLIDS (TDS)
- TEMPERATURE
- PH
- ALKALINITY
- TURBIDITY

FIRST NEAR
THE BANK...

I WAS IN THE
DISSOLVED OXYGEN
GROUP

THEN THE
RIFFLES...

THEN
EVERYWHERE.

CRITTERS USE DISSOLVED OXYGEN TO BREATHE.



CRAYMOND
NOTICED SOME
CHANGES TOO

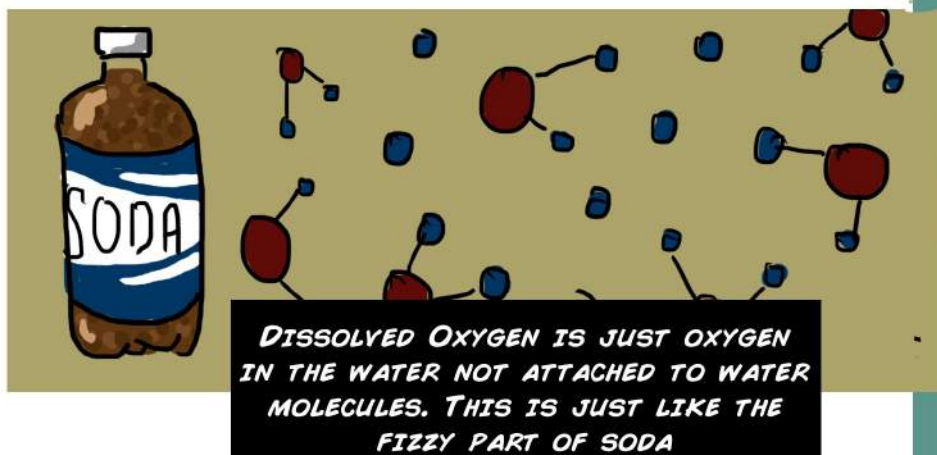


WE LOOKED AT
TEMPERATURE AND
DISSOLVED OXYGEN
(DO) FIRST BECAUSE
THEY CHANGE THE
FASTEST



COUGH

HIS BUDDIES
WEREN'T TOLERANT
OF POLLUTION
WERE DISAPPEARING



MANY THINGS EFFECT DISSOLVED OXYGEN



WIND
EXPOSES WATER TO
AIR AND ADDS
DISSOLVED
OXYGEN



WATERFALLS
MIX WATER AND
ADD OXYGEN



DEAD LEAVES
USE OXYGEN
TO DECAY



RAIN
STIRS WATER
AND ADDS OXYGEN



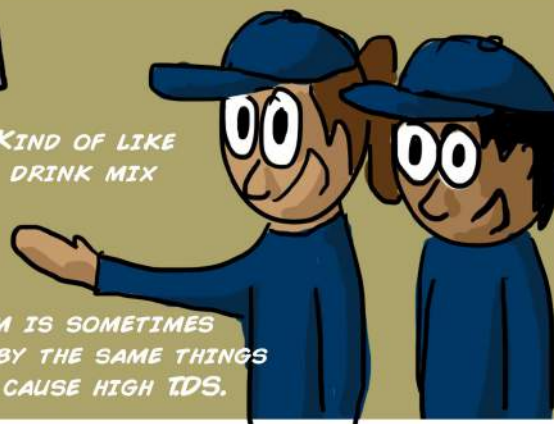
PLANTS
MAKE AIR
WHEN THEY
BREATHE

MR. WALTERS AND THE CREEKERS
EXPLAINED TOTAL DISSOLVED
SOLIDS. THEY ARE SOLIDS THAT
ARE IN WATER BUT CAN'T JUST
BE FILTERED OUT

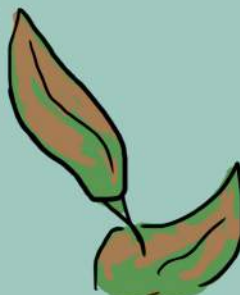


KIND OF LIKE
DRINK MIX

FOAM IS SOMETIMES
CAUSED BY THE SAME THINGS
THAT CAUSE HIGH TDS.

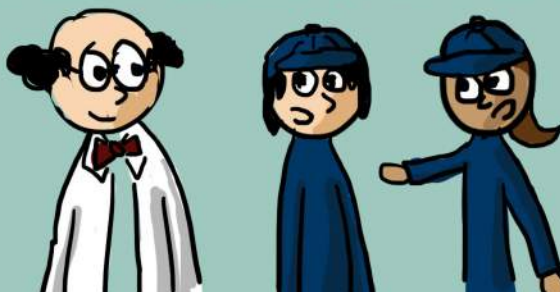


DEAD GRASS AND LEAVES CAN BECOME
DISSOLVED IN THE WATER WHEN THEY
DECAY.



NUTRENTS, ROCKS AND DIRT
CAN DISSOLVE INTO WATER TOO

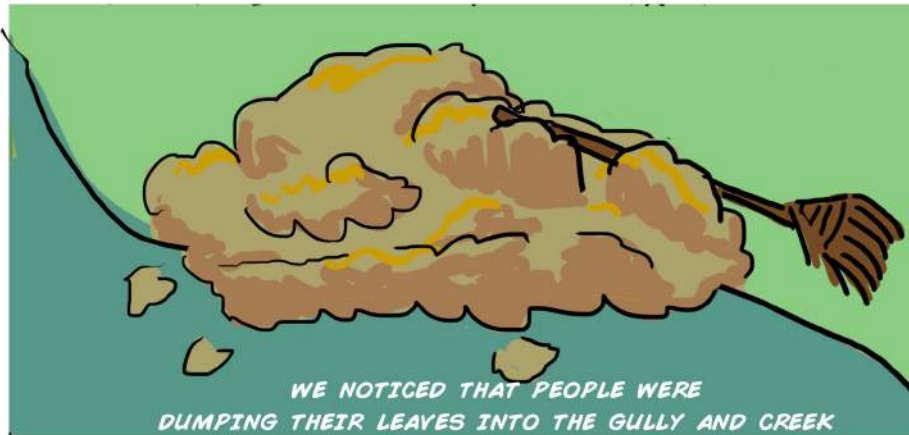
JUST LIKE TDS, FOAM CAN BE CAUSED BY NATURAL REASONS
OR BY HUMANS. YOU'LL HAVE TO KEEP AN EYE ON IT.



THAT DAY ON OUR WALK HOME...



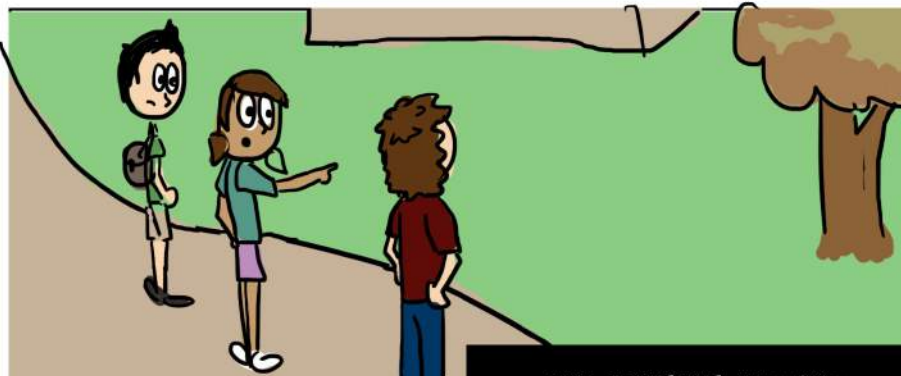
WE JUST LEARNED
THAT LEAVES CAN
EFFECT THE LEVELS OF
DISSOLVED
OXYGEN AND TDS.



WE NOTICED THAT PEOPLE WERE
DUMPING THEIR LEAVES INTO THE GULLY AND CREEK



BUT THERE ARE
ALWAYS LEAVES...



AND SOMEONE HAD CUT
A LOT OF THE PLANTS ON SHORE



MAYBE THIS PERSON
CUT ALL THE PLANTS
DOWN, WHICH LETS
NUTRIENTS FLOW
INTO THE STREAM.



IT DRAINS
STRAIGHT
INTO THE CREEK



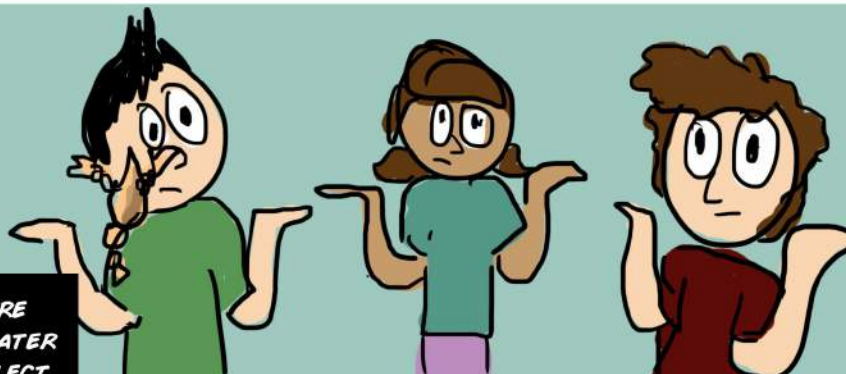
WHAT ABOUT THIS DRAIN?

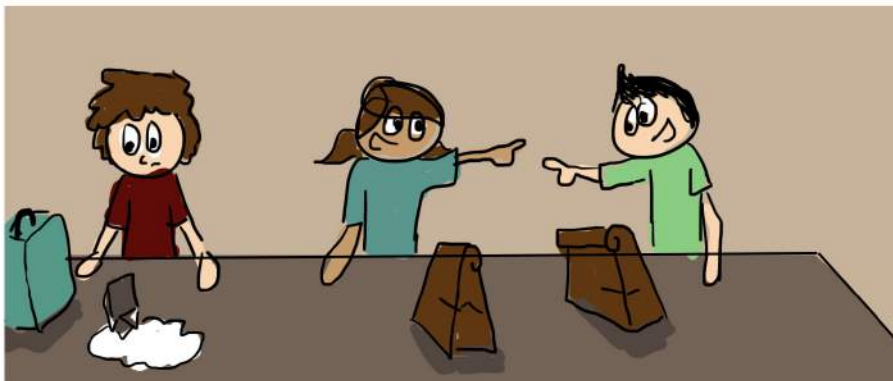
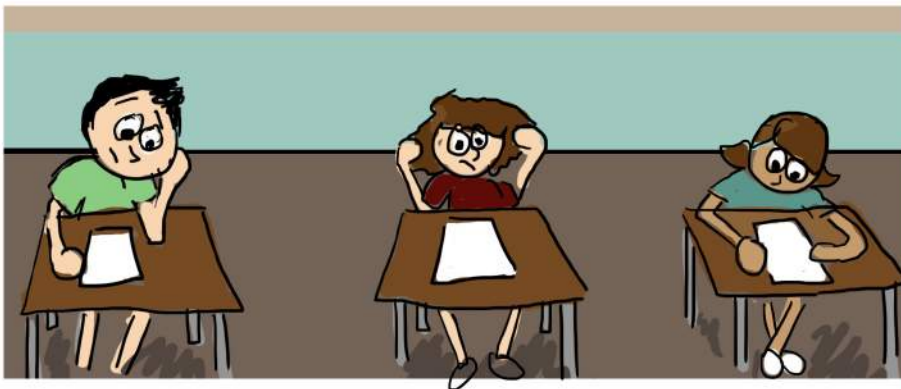
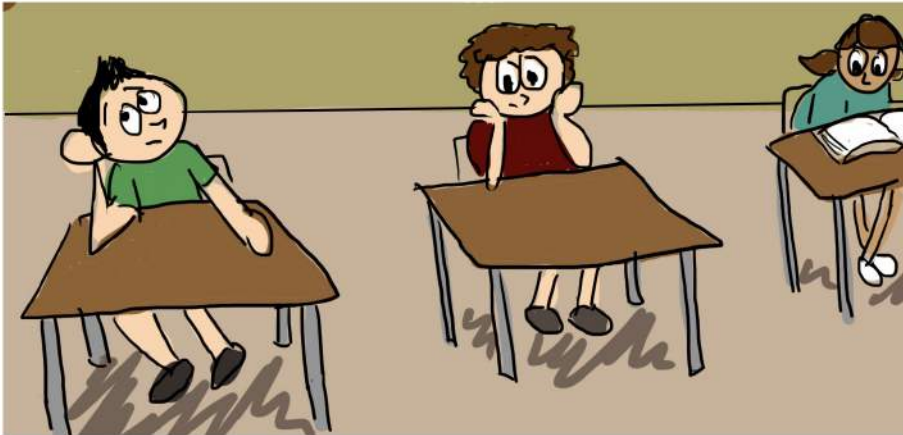


BUT CRAYMOND SHOWED US
THAT THESE PIPES ARE COMMON



I READ THESE ARE
CALLED STORMWATER
PIPES THEY COLLECT
WATER FROM OUR
ROOFS, DRIVEWAYS,
ETC, AND BRING
THEM TO STREAMS





**WE ASKED
MR. WALTERS WHICH
COULD BE THE CAUSE
OF THE FOAM, BUT HE
WAS BUSY GRADING**



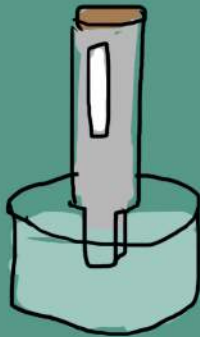
**EVEN ALL OF
OUR BOOKS COULDN'T
HELP**

**MEANWHILE,
THE FOAM KEPT
GETTING WORSE**



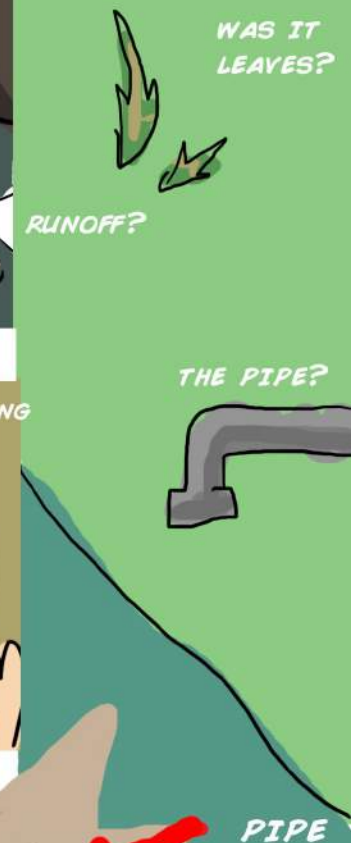
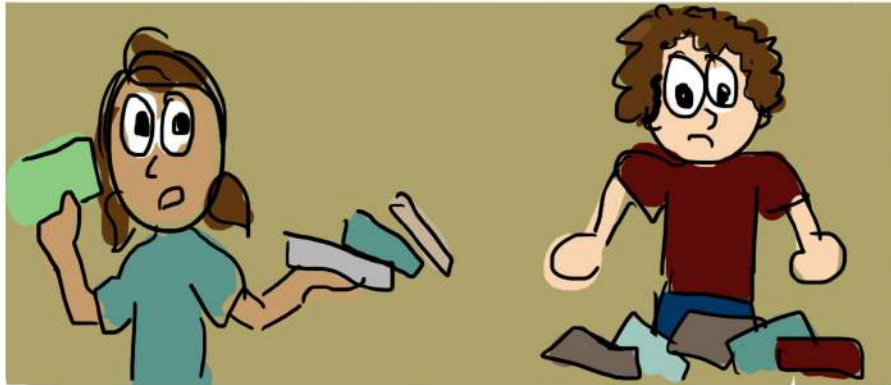


WITH MORE
WATER TESTING



DISSOLVED
OXYGEN LEVELS GOT
LOWER AND
TDS GOT HIGHER







WE TOLD MR. WALTERS HE HAD NEVER THOUGHT
OF THAT BEFORE, SO HE
HELPED US SHARE OUR IDEA





WE EVEN GOT HELP
RUNNING CHEMICAL TESTS



AND THIS MADE THE
NEWS EVERYWHERE

IN STREAMS NEAR YOU!

Feature Creature! Stoneflies



Range: cooler temperate parts of the world
most nymphs develop in cool, well-oxygenated
water and do not tolerate pollution;

Life cycle: Life cycle: females deposit several egg
masses, which together may total more than
1,000 eggs. Nymphs require one to three years
to mature; full-grown nymphs leave the water,
cling to shoreline vegetation and debris, and molt
into the adult stage

Food: Nymphs feed on algae, diatoms, mosses,
and immature aquatic invertebrates

Fun Fact: Stoneflies do pushups to rush water
over their gills so they can breathe. Also once
they become adults they don't eat food!

Recognize Us?

We are a flies that you might see during the
summer time. We think you're awfully sweet,
and wouldn't mind a bite. Don't worry though,
when you find us in the creek, we won't
have grown our chompers yet...



Horsefly Larva



Blackfly Larva

We make great food for other
macroinvertebrates and animals.

EEEEK!

These guys aren't just from a horror film,
they're in creeks and streams all
around North America!

Meet the hellgrammite (larva)
and dobson fly (adult):



Did You Know?

Not all species of leeches are
"blood suckers", and
some leeches even just
settle with eating other
leeches instead.

Also! Leeches are used for
some medical practices, such as
to help with skin
grafts for burn victims.



Do You Have a Creek Advertisement?

Send it to us, and maybe
you'll be featured in the next
issue of French Creek Mysteries!

SO ALWAYS BE ON THE LOOKOUT!



Chapter 4

WITH OUR CHEMICAL TESTS WE DISCOVERED THE SOURCE OF THE OF POLLUTION. A HOUSE NEAR THE SCHOOL



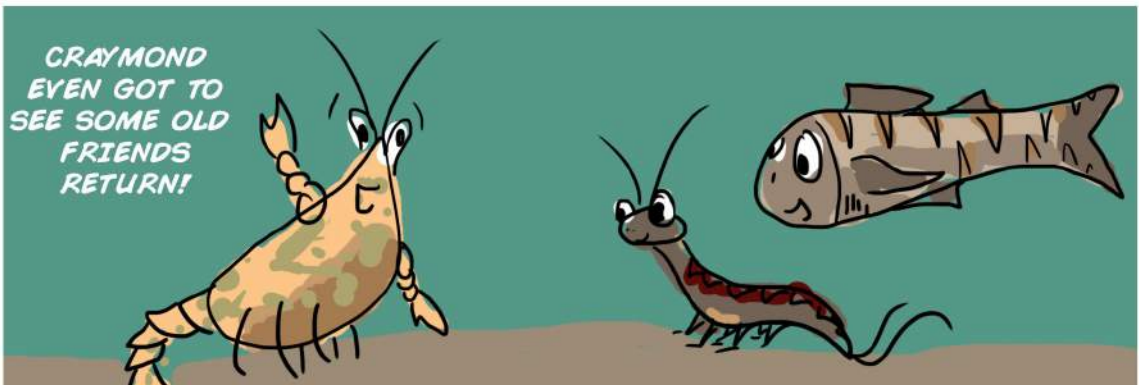
I GUESS PRINCIPAL HIGGINS WON'T BE DUMPING CHEMICALS IN THE STORMDRAIN AGAIN SOON.

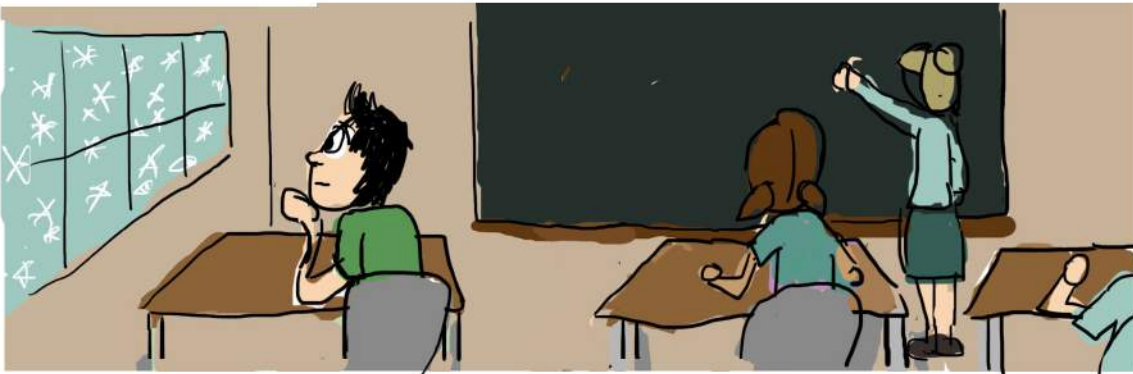


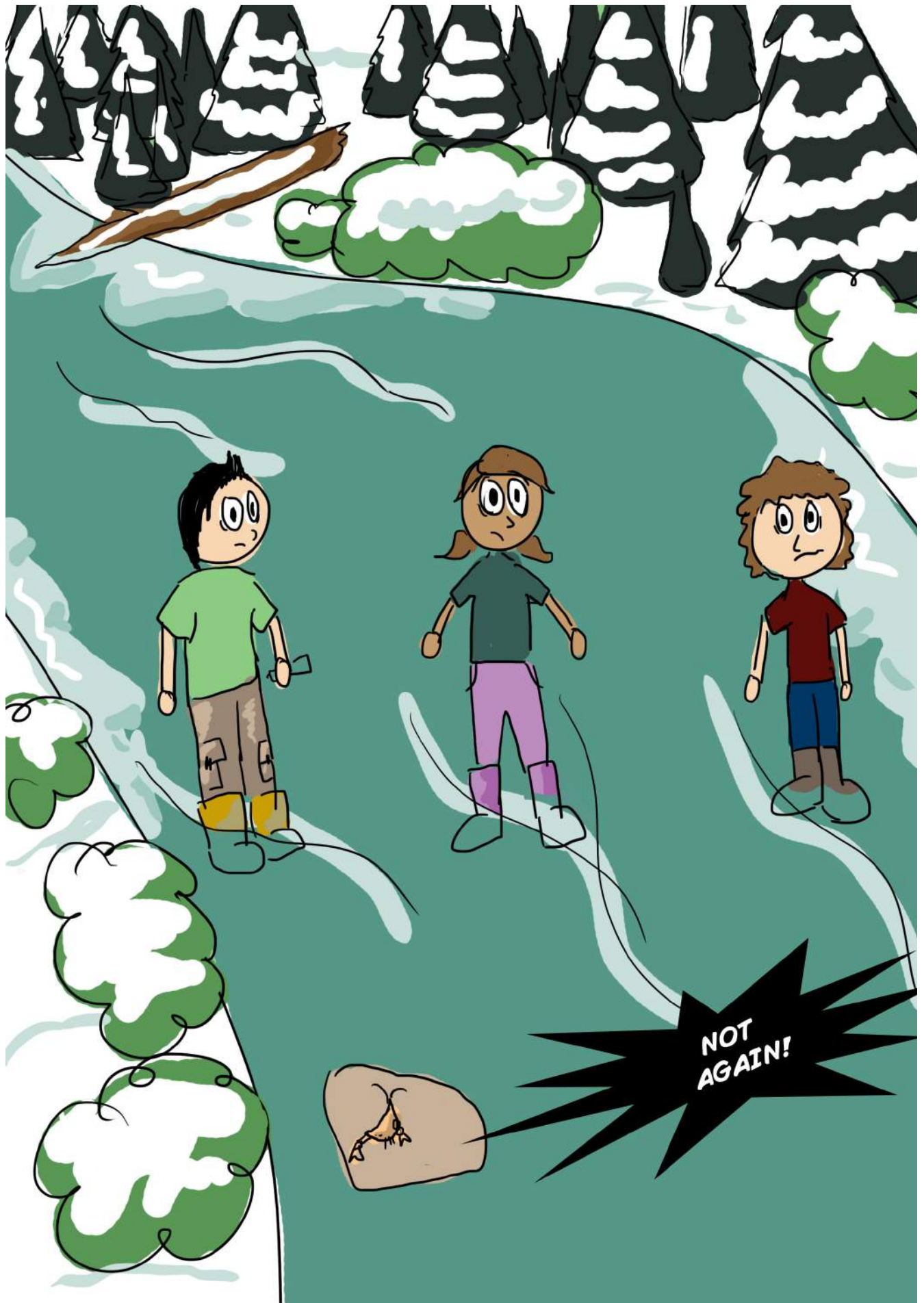
THANKS TO A LITTLE PUBLICITY



GRAYMOND EVEN GOT TO SEE SOME OLD FRIENDS RETURN!







(Sizes of illustrations are not proportional.)



***"THIS BOOK WAS THE MOST INSPIRING OF ANYTHING
I HAVE READ; IT CHANGED MY LIFE"***

-LAURA BRANBY

"I LAUGHED... I CRIED... IT'S A MODERN CLASSIC!"

-JOHANNA STANLEY

***A JOY TO READ! YOU DON'T KNOW THE CREEK
IF YOU HAVEN'T READ THIS BOOK!***

-CAMILLE SICKER

***ESSENTIAL READING. A WONDERFUL RESOURCE AND
A GREAT EDUCATIONAL TOOL.***

-WENDY KEDZIERSKI

