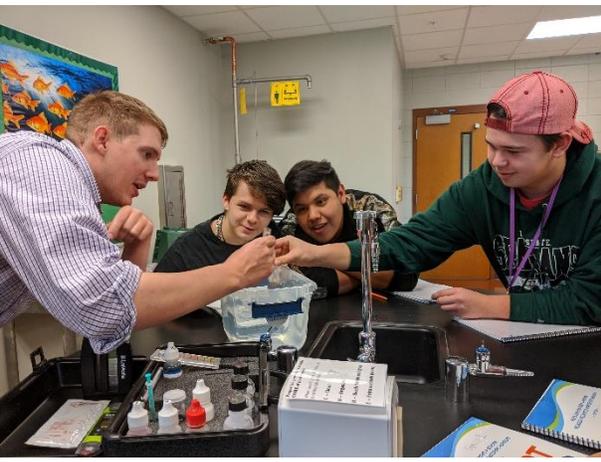
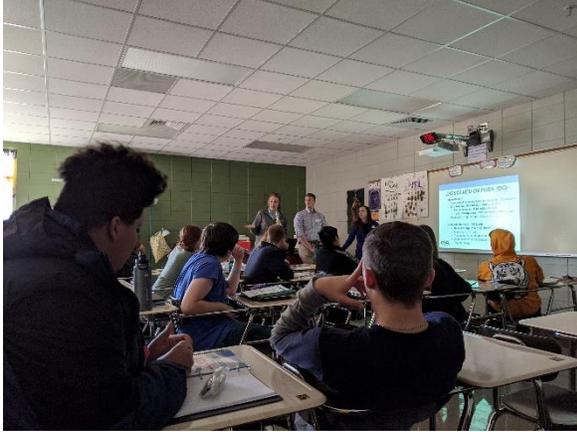


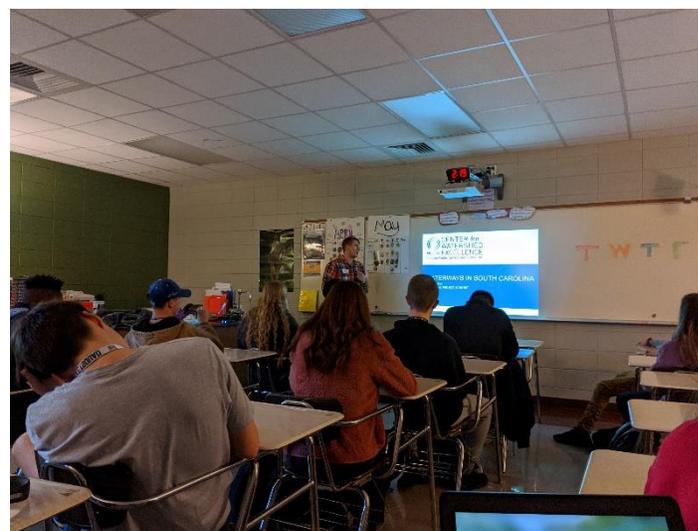
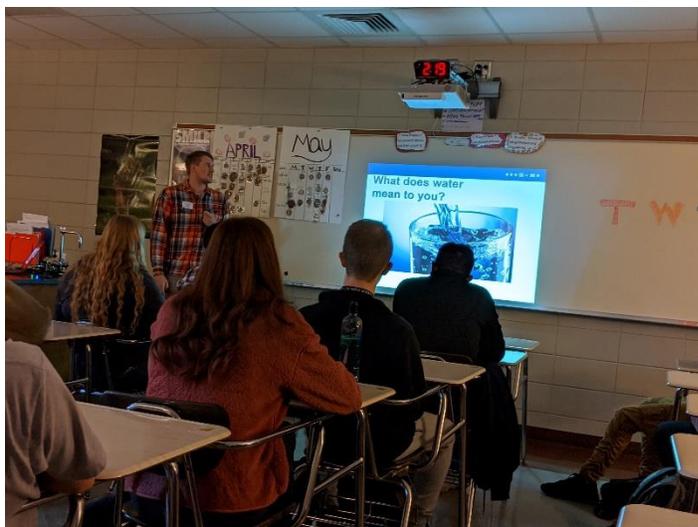
PROTECT Water Quality Walhalla High School

Water Quality Learn

At the beginning of the semester all Green Steps Students participated in an Adopt of Stream training with our local 4H educators Mallory Dailey, her intern Anaston Broome. All students earned their Adopt A Stream certification in Habitat Assessment, Chemical and Bacterial Testing. As AAS certificate holders students could test creeks outside of class!



Zach Nemeč is a watershed scientist from Clemson's Center of Watershed Excellence came out to give our Green Steps class more information about the governance of watersheds and how to navigate the Adopt a Stream website to enter their citizen science stream data.



Emily Pomeroy is a program associate for the Chattooga Conservancy, a grassroots nonprofit specific to protecting the Chattooga River. Emily gave a talk about her watershed data collecting experience, the development of the Warwoman Watershed Plan and mitigations efforts around her findings.



Our Environmental Science classes learned about the biodiversity of macroinvertebrates and their differing sensitivities to pollutants, oxygen rich and deprived stream environments. Local Adopt a Stream mentors Denise and Andy Chesson helped students key out the macros and tally up our stream count.



Water Quality DO

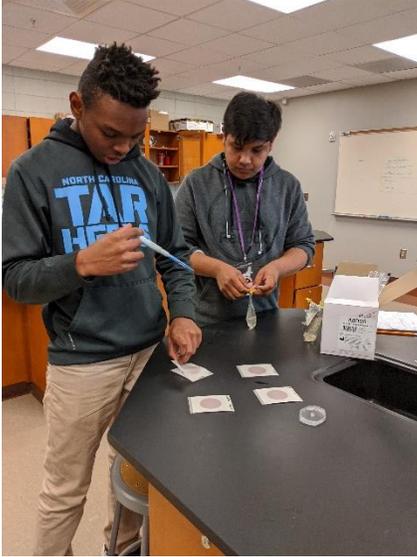
Students conducted habitat assessments, chemical and bacterial test and uploaded data for four local creeks before schools closed for the coronavirus pandemic.

Williams Creek is on Campus and is monitored monthly by Green Steps and Earth Science classes.

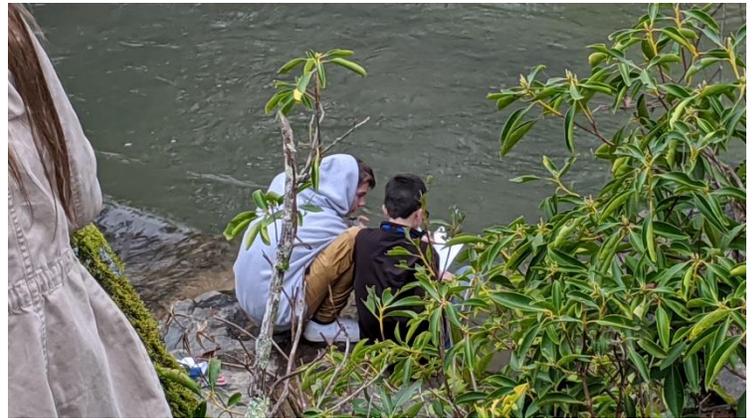
Green Steps added Cane Creek by Sertoma Field, Flat Shoals and the North Fork of the Little River into our monitored sites.

When we go back next year we hope to continue our efforts to monitor the added creeks in our Lake Keowee Watershed.

Cane Creek



DO at Flat Shoals and the North Fork of the Little River



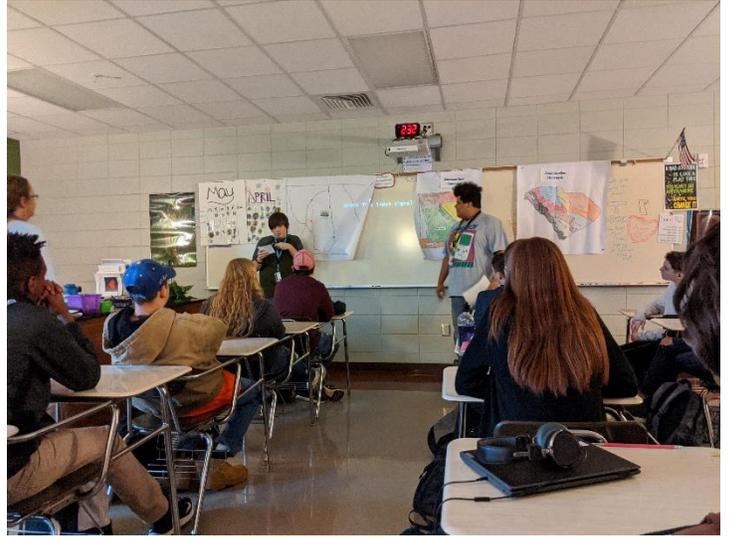
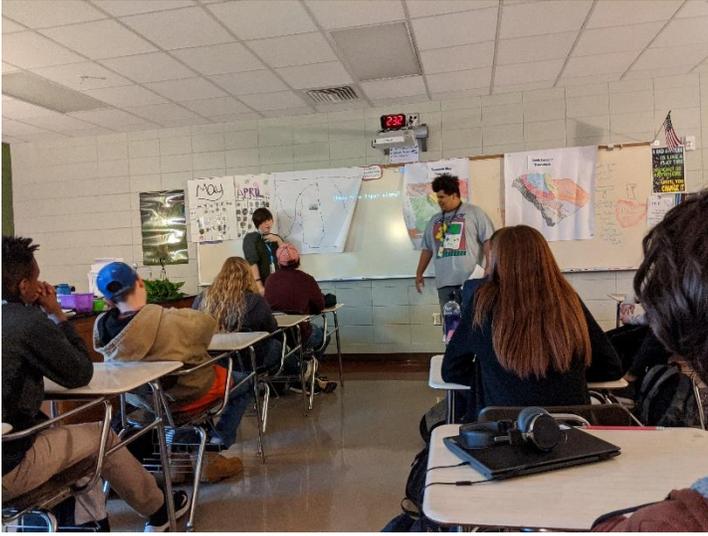
Doing Water Quality Testing at Williams Creek

This is a picture of our last day together as a class before the pandemic separated us. Williams Creek is on campus and a beloved place to escape from the classroom by students and teachers alike.

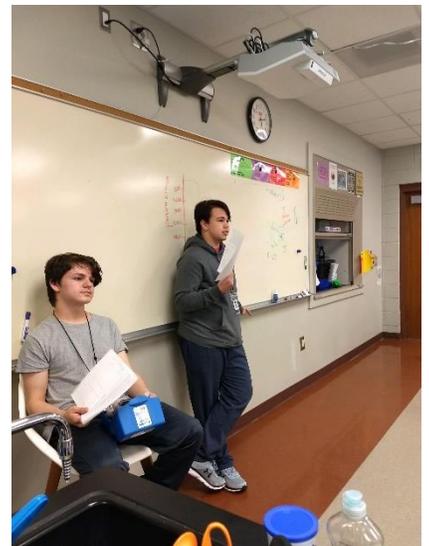
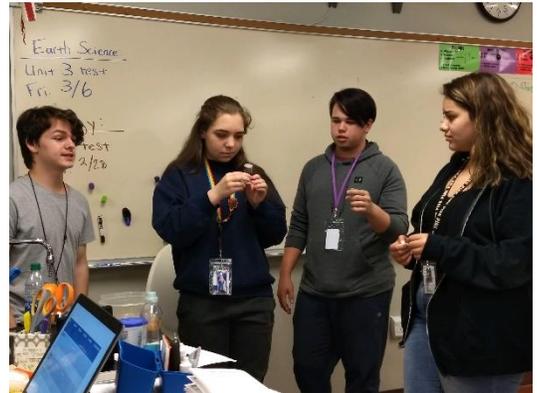
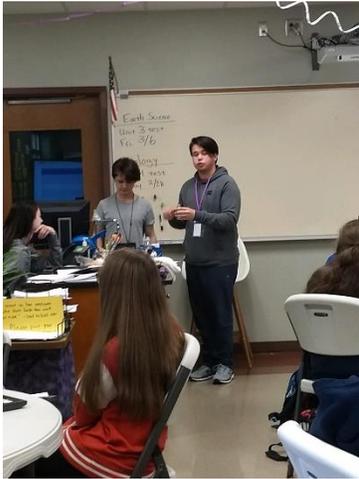


Water Quality Teach

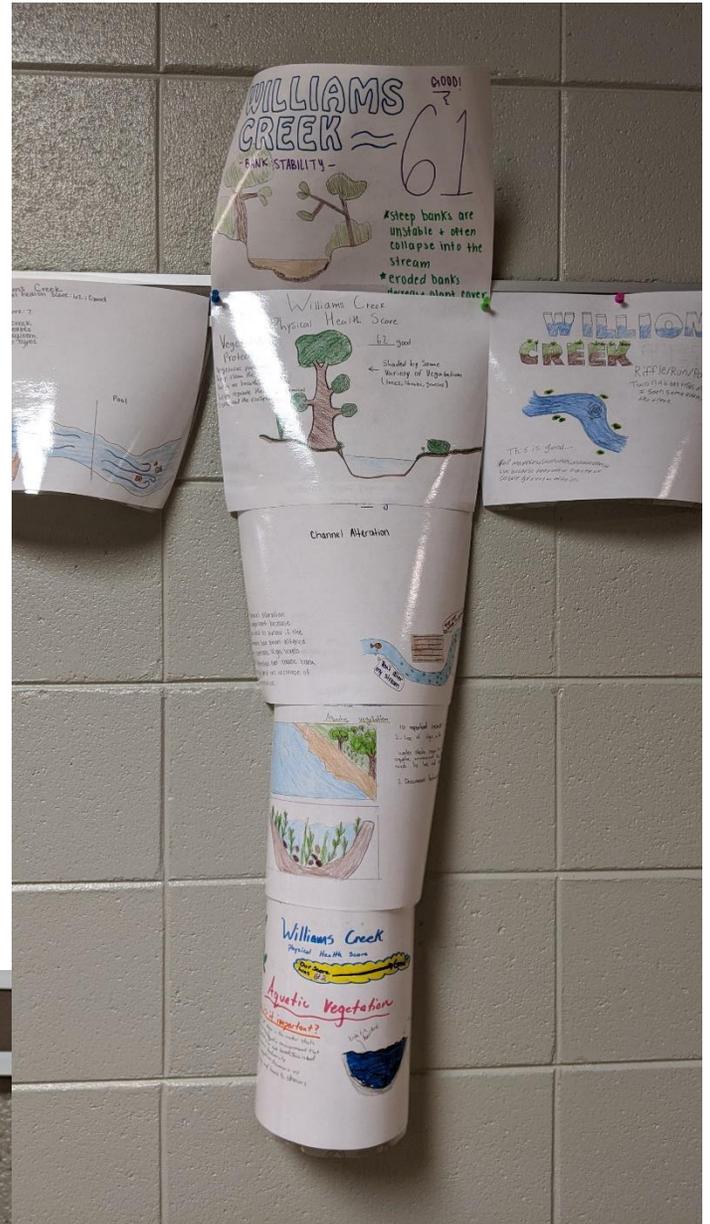
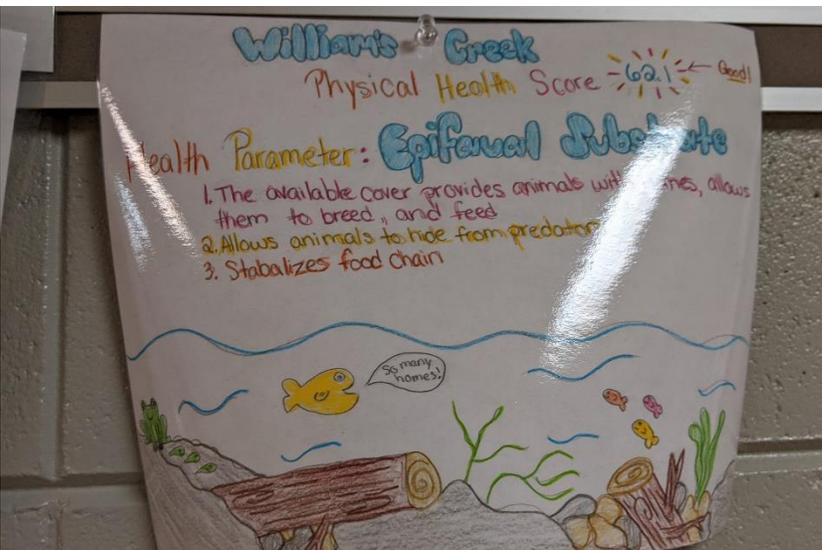
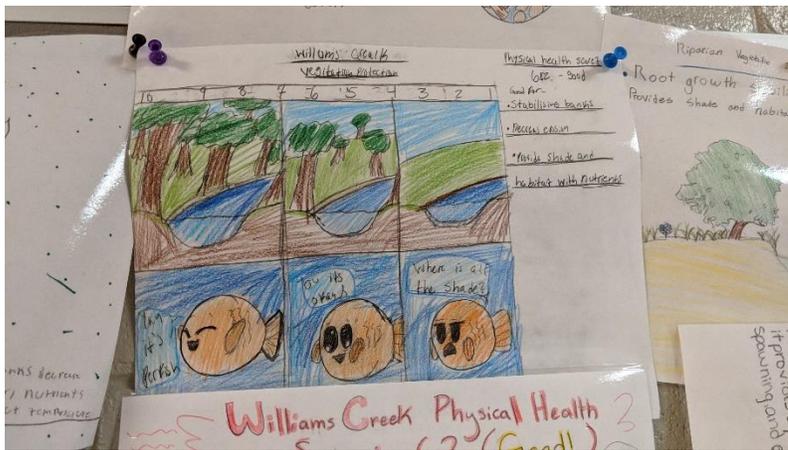
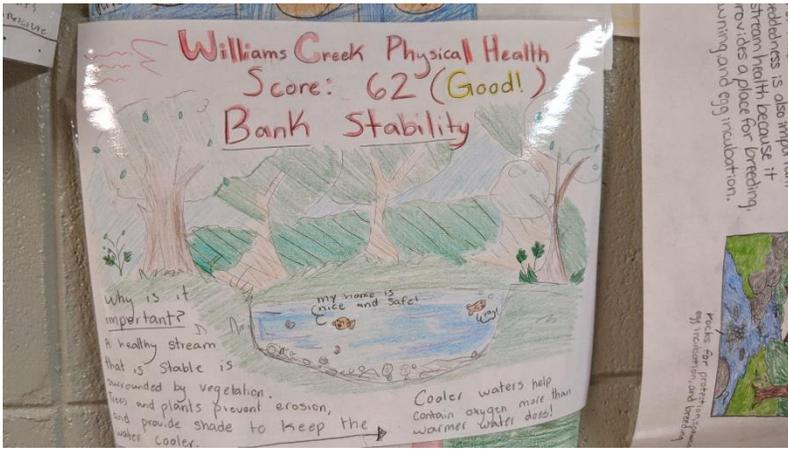
Green Steps students worked in teams of 2, 4's or 5's on a Powerpoint presentation to present in front of the class. We were hoping to choose our best and most willing group to present to our faculty and then at a school board meeting. We hope to do that next year. Students worked out most of the kinks in a few practice sessions and then delivered their presentations. Our special needs students had the most fun delivering their presentation to the class.



Our Earth Science classes learned about water quality testing and the Adopt a Stream Program as part of their Hydrosphere unit. A few brave souls from our Green Steps class took on the challenge of teaching Ms. Ambrose's freshman class of 28 students the ins and outs of chemical and bacterial testing. Notice the exhausted looks on their faces by the end of the task!



Earth Science students explored the hydrosphere through the lens of water quality, watershed awareness and stewardship via Adopt a Stream. Students really enjoyed learning fancy words like epifaunal substrate and embeddedness. At the end of the unit students made informational posters about habitat assessment parameters and the overall score for our home creek.



WHS Restore: Composting & Food Waste

Learn

Our Earth Science team decided that we would build composting and soil health into our unit on the Geosphere. The unit began not so interestingly with basic information about soil horizons, soil profiles and the texture triangle. We pivoted our lessons from here to talk about sustainable farming, soil enrichment and the food waste issues at every level in the supply chain. We didn't take pictures of students while we were giving notes or while they were completing research. David Thorton former director Clemson University's composting facility was scheduled to give an informational talk to Green Steps and our Earth Science classes, unfortunately school was cancelled due to the corona virus.

Composting DO Soda Bottle Bioreactors



Earth Science students recued plastic bottles from our recycling bins and from home to make the soda bottle bioreactors aka mini composters for the classroom. Students gathered browns or carbon sources from campus; mainly lots of leaves, small sticks, sawdust from the Ag shop and paper from the recycling bins. Students also rescued food greens from the share table in the cafeteria, from their fridgerators and I



rescued 3 boxes of "unfit" fruits and vegetable from our local Ingles in West Union. Students were especially excited out the rescued food after watching several videos on food waste in America. Our Family and Consumer Science teacher lent us lots of good cutting boards and knives.

Enjoy the photos of students enjoying the hands-on construction phase of building the bioreactors and chopping up rescued food.



Composting DO at Home

One of our Green Steppers decided to build his own composter at home after the at home unit on Don't Waste Food SC.



In the pictures above, you can see Brady making his composter at home with his family. In the second row of photos Brady is checking the temperature of the compost for thermophilic activity, adding table scraps and unwanted food from his kitchen and mixing it all up.

Vermicomposting DO at Home

One of our teachers gets medication delivered in a Styrofoam cooler every month. She gifted these coolers to Green Steps! Earth Science students prepped the coolers by adding the right ratio of browns to greens while they were making their soda bottle composters. Green Steps students spray painted them with the Green Steps logo and added red wigglers we bought from Uncle Jim's Worm Farm to them. Four composters were sent home with teachers and administrators for them to babysit. Here are some pictures of them in action at their homesteads.



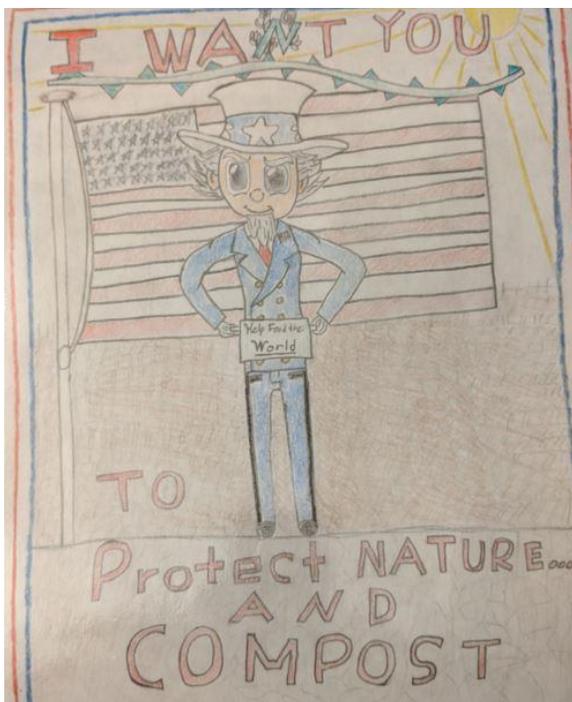
Roller Bin Composting At School DO

After we established the soda bottle bioreactors students were introduced to our rolling composter outside. Earth Science and Green Steps classes got in habit of getting leftover foods from the share table in the cafeteria, chipping it up and adding the food to the vermicomposters and the rolling bin outside. Next year we'd like to develop a monitoring system to help students evaluate the effectiveness of the composting process. Check out these students in action!



Composting Teach

Students made informational flyers about both food waste and composting. We posted these up around the school in the hallways to help spread the word about these issues and to raise awareness of our efforts to compost and use food waste from school in our bins.



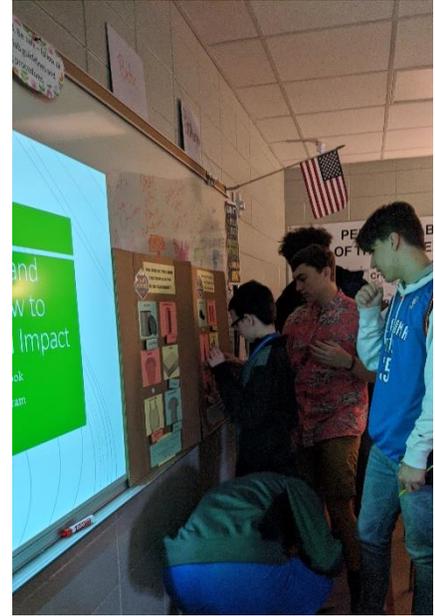
WHS Conserve: Recycle On-site, Off-site and Mail in Recycling

Learn

Maureen Whitman and Christina Passafaro came out to Walhalla High to give a presentation on Solid Waste and Recycling in



Oconee County. The presentation covered a range of topics the history of waste management in our county to the type of landfill we have, to what is in the trash they collect



and the amount of money we spend to send our waste to a residential landfill. Students got to interact at the end of the presentation to win prizes (they really perked up for this part!)



You can see all the students up at the board competing to see you know how long it takes certain household items to

degrade. Also featured is one of the lovely winners of a reusable water something that should be issued to all students at registration!

What do we do?



- Manage Solid Waste generated in Oconee County
- Solid Waste is made up of household trash and recyclables
- Oconee County runs eleven recycling centers where citizens can take off trash and recyclable items.
- Oconee County also runs the Seneca Landfill and Oconee Transfer Station

Learn at

We've been trying to tackle lunchroom plastics and also snack bag recycling. I

collaborated with our media specialist, Rhonda Smith to create a virtual lesson to address both issues using persuasive letter writing. Mrs. Smith put together a screencast video detailing the ins and outs of researching and the necessary structure of a persuasive letter.

Students were given the option to address either plastic in the

lunchroom or the need for zero waste boxes to capture all of our snack bags sold by our snack carts. Attached is Mrs. Smith's video as part of the Learn part of this at home project.

Write a compelling and informative letter to April Howe, the lead purchaser of our lunchroom food program to decrease the use of single use plastics and plastic packaging in general.

OR

Write a compelling and informative letter Mr. Garrett requested an installment of several zero waste boxes to capture the snack bag waste generated at WHS yearly.

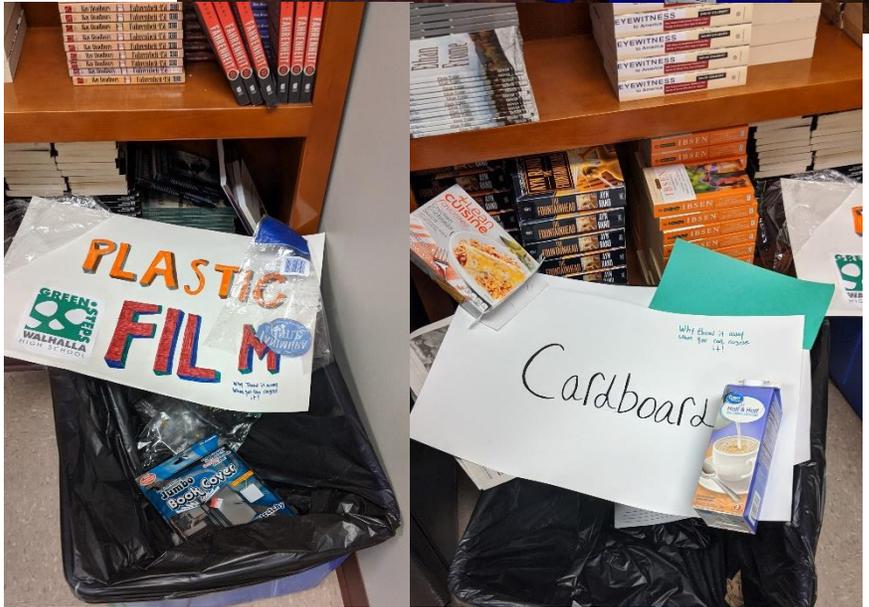
<https://drive.google.com/file/d/1JTLPq95xL4iJzWftKyO2oFZF296jeWxu/view?usp=sharing>

Recycling DO

We already have an amazing collection system in place for weekly collection of classroom plastics 1-6 and paper. Although our teacher breakrooms had recycling bins our team decided to touch them up with better signage and organize the area to help with the collection process. We also wanted to offer a new opportunity in our teacher break rooms to collect something that ends up in the plastic recycling bin but doesn't belong there; plastic film! We made lots of signs for our plastic films bins and took the time to create some sorting games for what we can and cannot recycle at WHS.



Science Breakroom



English



Custodians were willing to collect plastic film from the missive amounts of toilet paper we use throughout the year.



Check out Ms. Gladys in the back of our local Ingles dropping off all of the plastic film collected at WHS that can't be recycled at our local recycling center.

DO

Once we had new signs and bins in place in the library, teacher breakrooms and the front office work room we realized that our biggest meeting place the professional development room also need both bins and signs. A group of student's spray painted our stylish logo on the bins and created so attractive signage so that it would be clear what goes in each bin. We let all of our collection teams know about the new bin locations and our new waste stream!



April 13, 2020

Persuasive Letter Writing DO

Mr. Garrett
Front office
151 Razorback Lane
Walhalla, South Carolina 29691

Dear Mr. Garrett:

The snack cart sales are great. The snack cart is the best idea for the high school filled with hungry kids. But there is only one problem with the snack cart. All of the wrappers to these candies/snacks aren't recyclable. All of these wrappers are getting thrown in the trash and is making a negative impact on our environment. What would be really interesting is to track how much waste Walhalla High School school is actually producing. A great way to do that is by using TerraCycle.

TerraCycle is a company that makes recycling accessible to people who do not know how to recycle it. They make these Zero Waste Boxes that are required to be bought. You buy a certain box for what you are wishing to recycle. For example, candy and snack wrappers. All you do is collect your candy/snack wrappers in the boxes and ship them back to TerraCycle where they will repurpose them completely. You're probably wondering what happens to these wrappers. The collected waste is broken down into fibers that can either be composted or recycled. The plastic products are made into tiny pellets that will eventually be used to make new plastic products.

This TerraCycle Zero Waste Box would be an amazing addition to our school. First of all, we can track how much waste is being produced with the school's snack cart and make an end to wasting all of those products that can be recycled somehow. Last of all, this would be a good contribution to our environment. There are so many harmful things happening to our planet and waste that cannot be recycled is just one of them.

Sincerely,

Pepsi Recycle Rally: Walhalla High

- Through recycling Walhalla High saved 107,760 kilowatt hours. That's enough to power a large school cafeteria and kitchen for a full year!
- The weight of recyclables was equivalent to a Killer Whale
 - Pounds collected 17506
- Avoided the production of greenhouse gases that otherwise would have been offset by 25 acres of mature trees
- Saved the amount of paper/cardboard that could have been derived from 100 oak trees

Teach

After getting everything in place we made a game that we saw at molded at a Litter Free Football Game hosted by Keep Oconee Beautiful Association. This game was really a test to see if students, teachers, administrators and staff knew what we could recycle at WHS and if they knew what plastic film was. Students pilfered through our plastic film bins

for things that would be high frequency items at home and school e.g. plastic snack bags and packaging materials. Students got the green light from our media specialists to quiz students and other visitors in the library. Our office staff also volunteered to be the guinea pigs for practice runs with this sorting game. Students were unable to deliver any videos of this happening but I've attached a video showing what's inside the sorting game. At the beginning of the year we joined the Pepsi Recycle Rally as a way to compete with area schools. Our numbers were recorded at the recycling depot and entered into the Pepsi database. Our recycling coordinators shared the information they received from Pepsi which you can see below. We planned to broadcast this on the screen in every hall way as part of the teach component. One of our

Economics teachers delved into the South Carolina Solid Waste Management Annual Report for Fiscal Year 2018 while her student teacher took over her course load. This is what she cranked out, posted in all of the break rooms and projected on all the hallway monitors.



Click to watch the video

https://drive.google.com/file/d/1RrtgArprXxGJG3zzTjaQFNnG8ov_rS0p/view?us

Recycling and your tax dollars

When our recyclables are sent to be disposed of instead of recycled it costs the government money to throw them in a landfill

If they are recycled, then the government makes money\$\$\$

In 2018, SC spent 24 million dollars disposing of 630,920 tons of recyclables.

We could have made 68.4 million for the sale of those recyclables!!

Why would we continue to fill up landfills when there is a better and more economically sound choice?

**Recycling creates jobs (22,000 as of 2019)
Recycling has a 13 billion dollar impact on our economy annually
It could be so much more if we do our part!!**

WHS Conserve: Reduce Waste Share Table at School and at Home

Learn at WHS

Earth Science teachers coupled our geosphere unit with soil health, food waste and composting. T Students watched videos detailing the complexity of the food waste issues in the US. Students learned that consumer demand for size, shape requirements of produce generates lots of waste. Students also learn about the pricing, demand and the gaps that exists between the two which leads to a lot of wasted crops. We pivoted towards an obvious solution at school the cafeteria share table. We brainstormed with the lunch ladies about the placement of the share table in the lunch room because unwanted food didn't end up at the share table. More often than not fruit and unwanted items ended up at the condiment and napkin area. A decision was made to move the share table so that it was in front the condiment area. Students suggested making informational memos for each basket so students could help keep the table and baskets organized.



Learn at Home

The first at home assignment for Green Steps students was to read the Don't Waste Food SC pamphlet. Students were instructed to clean out their fridge and organize it to lengthen the life of the food inside. Lots of learning on the which fruits accelerate the ripening process and where in the heck to put veggies so they don't wilt. Students also got in the know about the confusing differences among date and safety labels found on all food items.



Understand the Date Labels: Are those dates actually 'expiration' dates?

Not sure what those food date labels mean? If you've been throwing away food because of the printed date, you're not alone. Here are four important things to know.

- **The only EXPIRATION date required by federal law is infant formula.** South Carolina requires quality date labels for eggs and shellfish. Other states may have label requirements as well.
- **Other food date labels refer to quality – not food safety.** These labels are not expiration dates. The dates are provided by manufacturers to give consumers an estimated time that the product will be of peak quality or to help the store determine how long to display the product. "Best by," "sell by," "use by" and others are defined below.
- **If stored properly, a product should be safe, wholesome and of good quality after its quality date.**



End the Confusion: Food Date Labels Defined

- **BEST BY, BEST IF USED BY or BEST IF USED BEFORE:** The manufacturer's recommendation for the best flavor or quality
- **SELL BY:** The store date for how long to display the product
- **USE BY or FREEZE BY:** The manufacturer's recommended date for use or freezing the product to ensure peak quality and flavor

Use your eyes and your nose.

If you note any "off" odor, appearance, texture or color in the food – regardless of the date – do not risk it.

DON'T EAT IT.



PRODUCE PAIRINGS CAN PREVENT WASTED FOOD

Many refrigerators have two drawers fitted with humidity controls. This is because:

VEGETABLES require HIGH HUMIDITY.	FRUITS require LOW HUMIDITY.
--	-------------------------------------

Only have one drawer? Use it for veggies. Package and store fruit elsewhere in the fridge.

Why does my produce go bad so quickly?

Some fruits and vegetables release a gas (ethylene) that causes increased ripening in other produce. Different fruits and vegetables have different levels of sensitivity to ethylene. Simply put?

Keep ethylene producers AWAY from items that are ethylene sensitive.



Reduce Food Waste at School DO



Every day after breakfast and after lunch a group of students would collect the items leftover from the share table. Students would chop it up, eat it, feed it to our vermicompost bins and or take it outside to our roller bin. Students competed for the opportunity to get out of class to get the goods from the lunchroom, have fun social time chopping up fruits with friends and lastly to check up on the composting process.

Reduce Food Waste at Home DO

Students were asked to share before and after pictures of cleaning and organizing the fridge to minimize food waste. Students were also asked to keep a food waste diary detailing how much food their family throws away with each meal, how they disposed of it and the estimated cost. Parents especially liked this activity because it encouraged students to help out with household chores 😊.

Tasty Trash: The \$55 Million Squawkfox.com Food Waste Challenge

Food Waste Diary

Day 1:

Meal	Food	Amount	How Disposed	Reason	Cost
Breakfast	Milk	1/2 cup	Kitchen Sink	Left over	20¢

Before the Activity

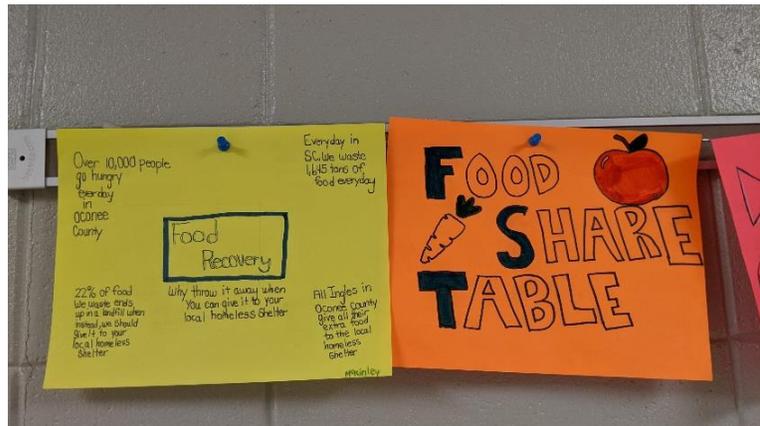


After the Activity



Teach Reduce Food Waste at School

Here is our share table at school decorated with student informational posters about the share table. The first week we rolled out the new system a few students volunteered to stand by the share table and talk it up with students to spread the word about the change and to let them know what we were composting the unwanted food. We also decorated the hallways in the science wing with student food waste posters.



LEARN

Our Green Steps class was invited to participate in a Walhalla United STEAM (Science, Technology, Engineering, Art and Math) Night. We choose the to do the plants in every home and classroom. Students started off by doing some research on plants and indoor air quality. There was some conflicting information online but students were able to plow through the difference to make a label that seemed to hold true for our audience. This is the label that a group of students made to put on the up cycled plant holders.



DO

We knew we would have to gather enough supplies to meet the demands of this event. We estimated we would need about 200 planters and that any leftovers could be

The flyer is for "Walhalla United STEAM Night Family Night". It features the STEAM logo (Science, Technology, Engineering, Art, Math) and logos for Walhalla United and Oconee. The event is on Monday, March 9th at Walhalla High School from 5:00 - 6:30 pm. It lists various hands-on activities in science, technology, engineering, the arts, and math, such as "Fizzy Rainbows", "Computer Science Coding", "Build a Periscope", "Metal in Motion", "Lung Investigation", "Superhero Gravity", "Chromatography", "Hero Parachute", and "VEX Program". It also mentions appearances by the Clemson Tiger and Walhalla Razorback mascots. A section titled "Career Connections: Local Industry and Community Members" lists names like Borg Warner, Itron, Schneider Electric, iMagine Upstate, Clemson University, Prisma Health, Duke Energy, Susan Jones (Bee Keeper), Jeff Bright (Drone Operator), South Carolina State Museum, Artists Mara Diaz & Will Hendricks, Oconee Law Enforcement, and Michelin. At the bottom, it lists "Food Trucks" including Mountain Mocha, Big D's BBQ, Meat in the Middle, Tacos, and Bla Bla Bla.



given to teachers and staff. We started by braving the big plastic recycling bin outside to make upcycled planters from the waste stream generated on campus. Students cleaned the



bottles and prepped them so that our visitors could make their own plants. Prepping them involved cutting them and then fixing the labels on them.

TEACH

Green Steps students volunteered to man the table, teach students how to assemble their planters for their plants and talk to them about plants and air quality. Unfortunately, our station was near the fish and macroinvertebrate exhibit so we weren't that popular. We were also stationed near the DJ so spreading the word about plants and air quality was slightly difficult. We learned some important lessons about how to be more successful next year at this event. We had a strong presence and were able to rub elbows with some of our Green Steps partners in the community.



WHS Restore: Habitat Bee Monitoring

Learn

Green Steps students kicked off the semester by learning about the bees in the observation hive, specifically how to monitor the hive for varroa mites. Students were introduced to the varroa through a traditional note session (sample of the notes) and then on to the library to the DO part of this project which also involved learning how to: identify mites on bees (unfortunately we found one), how to

What's a varroa mite?

1. What is it?

It is an external parasite that feeds on the blood of honeybees.

2. Why is it bad?

It can weaken the hive.

3. Is it normal?

Yes, unfortunately.

4. How can monitoring and data collection help?

It helps us decrease infestations because we know when to treat the hive.



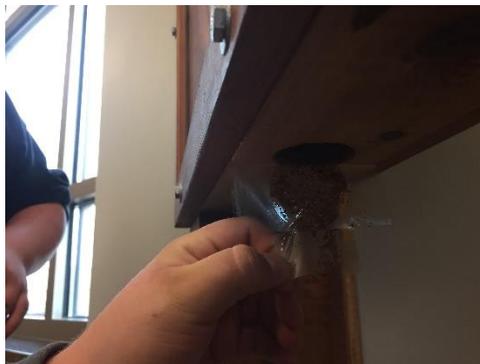
collect the bee tape, how to replace the bee tape, how to process the bee tape once back in the classroom using a microscope and lastly where to store the processed tape. As an additional part of the learn process students worked individually to research more details about the lifecycle of the honeybee, the lifecycle of varroa mite and treatments to control and treat mite outbreaks. These would eventually become part of the teach part of this project.

Do

The do part of this project happened daily. A lucky group of students went to the library to collect and replace the tape on the underside of the observation hive. The tape removal procedure is featured below in a series of pictures.



This is where the tape is located.



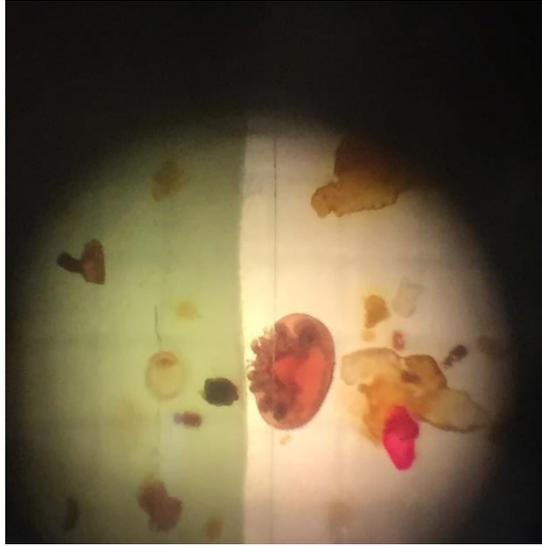
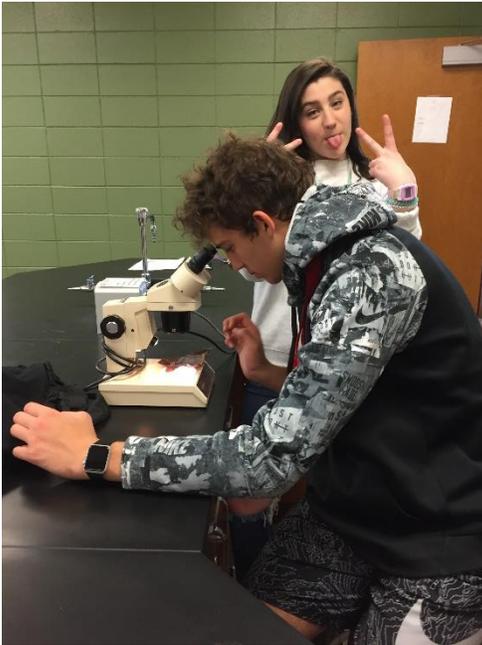
The bees use this hole as their trash.



It's fun to look at the trash under the microscope.

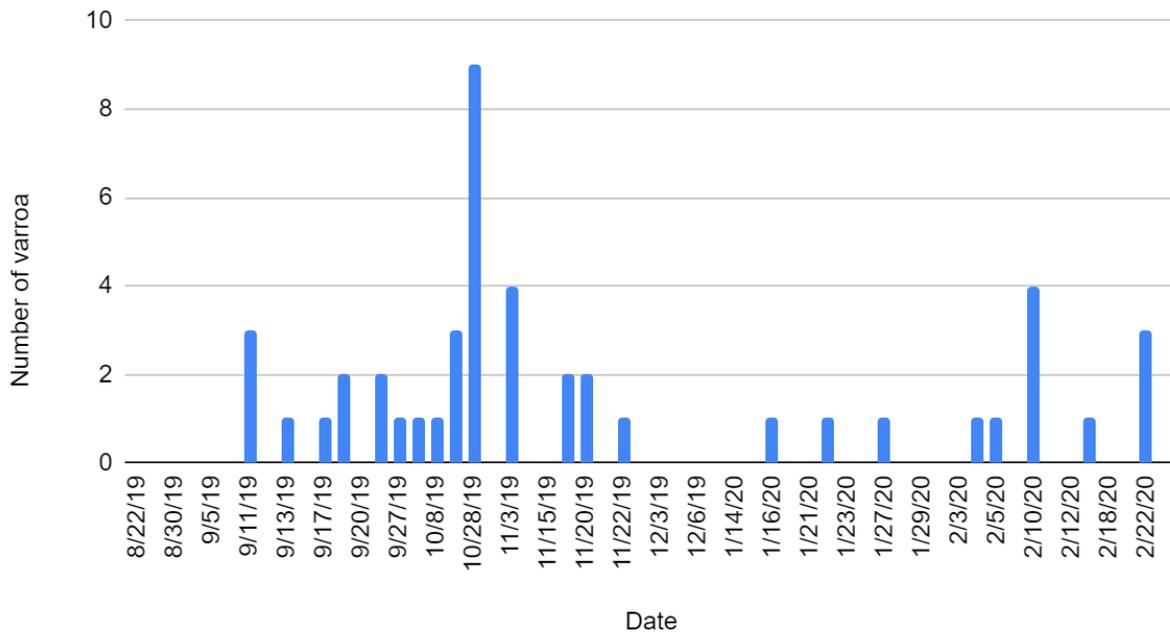
Do

Here are a group of students analyzing the bee tape to see if there are any mites to be seen. Once analyzed students would write the date and the amount of varroa mites found for the day on the tape and put it in a bag for safe keeping. The picture in the middle is an example of what a varroa mite looks like on the tape collected by students from the observation hive. The picture on the right is a small hive beetle larva which isn't a good thing. We also collect data on these nasty pests.



Every two- or three-weeks students would reanalyze the bee tapes and make changes if mistakes were found. We kept a running spreadsheet that we shared with our entire district. Almost all schools in our district are monitoring for varroa mite infestations in their observation hives. As you can see our varroa mite population was manageable! Much better than last year. Our treatments and monitoring seem to have a positive effect.

WHS Observation Hive Varroa Mite Count



Teach

Our bees are in the library and our library gets a lot of traffic. We decided to post up information about our bees and what they are dealing with at all of the library tables. Students were instructed to keep the information simple but with a good hook. Here are some of their finished products.

How to identify a varroa mite:

A varroa mite will appear as a small, reddish brown dot attached to the bee. They can be seen on the back of the bee, close to the wings, and on the sides of the bee. The mites even attach to the bee larvae and pupae. If you spot any varroa mites on our bees, you should take a photo and upload it to the survey on the [QR code](#) below.



The varroa mites is the world's most devastating honey bee pest. Varroa mites are external parasites that feed on the blood of adult honey bees. They also feed on larvae and pupae.

(If you happen to see any Varroa Mites, please scan the QR Code to alert Green Steps)



Look what this nasty thing can do to the bees

1. The queen lays up to 2,000 eggs per days.
2. Worker bees carry varroa mites with them into the hive, then the varroa mites jump off and go into the baby bee cell.
3. A few days later the varroa mites lay the first eggs
4. The mother varroa mites pierces a feeding hole in the baby bee
5. By the time the bee hatches, the varroa mites is all ready on.

If you see a varroa mites let

Green Steps know about it!

Scan the code!



WHAT
OTHER
PEST DO
BEES HAVE
TO WORRY
ABOUT?

A WAX MOTH



A VARROA MITE



A SMALL HIVE BEETLE



BEES HAVE
TO WORRY
ABOUT A
LOT OF PEST
SUCH AS...



What is a Varroa

Mite? A Varroa Mite is a small (no bigger than 1mm) parasitic mite, much like a tick, that infest honeybee colonies and feed off of their blood. The incessive feeding can kill the honeybee colony and/or spread numerous diseases which in turn cause the hive to die.



(To learn more about Varroa Mites and how they affect the bees, scan the code above)



Where to find varroa mites:

Varroa mites can be found attached to the honey bee. They can also be seen attached to the larvae and pupae. They spread colony to colony by drifting from workers and drones. Sometimes when honey bees raid other colonies, they can acquire the varroa mite as well. If you see any varroa mites on our bees, you can scan the QRC code below



and report it or upload a photo.



Protecting the bees from the mites

Bees really cannot do anything to protect themselves from the mites. The mites spread like crazy. Affected bees eventually die and find their way out of the hive. Let us know if you see one!



REUSE Upcycled T-shirts Walhalla High School

Learn Caption

Biology 2 classes (grades 10-12) and Small Animal Care collected old t-shirts and converted them into dog toys. Students learned about ways to reduce pet overpopulation, such as spay and neuter programs. In addition, they learned about programs that shelters implement to help care for dogs mentally and physically. Students learned to make dog safe toys out of common materials: t-shirts, bottles, and tennis balls.



DO Caption:

Students made the toys at school and then visited a local dog shelter to donate the toys. They were able to do basic training, a mini photo shoot, and play with the dogs.



Teach Caption:

Students researched and presented information about various dog breeds, their characteristics and need. They also researched and created their own dog food based on nutrition needs.

Next year, we hope to be able to have high school students teach middle school and elementary school students how to make toys and treats for dogs.

