

Problem Statement

Food waste is a major issue in this country, with an average of 33% of all food in the United States going to the landfill. This amount of waste accounts for enough land to feed the world's hungry. Several schools within Wylie ISD have made great strides in tackling this global issue. This includes the implementation of the Share, Shake, Stack program at six campuses in order to contribute to fighting food waste. The goal is to implement this plan at Wylie High School and Wylie East High school as well and build upon that success. Mega lunches that exist at these campuses pose unique challenges for the implementation of Share, Shake, Stack food waste hubs due to the various locations around campus available for students to have lunch, however it is still very possible to achieve these goals.

In addition to the Share, Shake, Stack method, Wylie ISD has excelled in limiting pre-consumer food waste which is the most important to reduce, due to source reduction having the greatest impact in the food recovery hierarchy. It is important to understand how the efforts of Wylie ISD can have a global impact. This is apparent with source reduction having the greatest impact on greenhouse gas emissions. In addition to this, food waste accounts for 80% of freshwater used in the United States.

Water depletion and pollution are some of the pressing issues this world is currently facing, and food waste has a huge role in this problem. Nutrient pollution is one of America's most widespread and challenging environmental problems and food production is one of the largest sources of nutrient pollution in this country. It is important that Wylie High School and Wylie East High School make conscious efforts to reduce as much waste as possible as well as repurpose any unavoidable waste.

Perhaps one of the most important issues that needs to be solved is education. In order for this plan to be successful, the students and staff need to care about the issues at hand. This can be achieved through educating the students, along with building a culture of stewardship and sustainability on campus. The U.S. Environmental Protection Agency reports that only 24 percent of people say they are very knowledgeable about reducing food waste. The bottom line is that food waste is a people issue. Wylie ISD can further improve in food waste through educating staff and students, and bringing awareness to the issue as a whole. The more people learn about their global impact, the more they will want to get involved.

Wylie ISD has already made great strides towards reducing food waste in this country, however, action needs to be taken in order to ensure that Wylie High School and Wylie East High School also does their part in building a better world and brighter future.

Project Justification

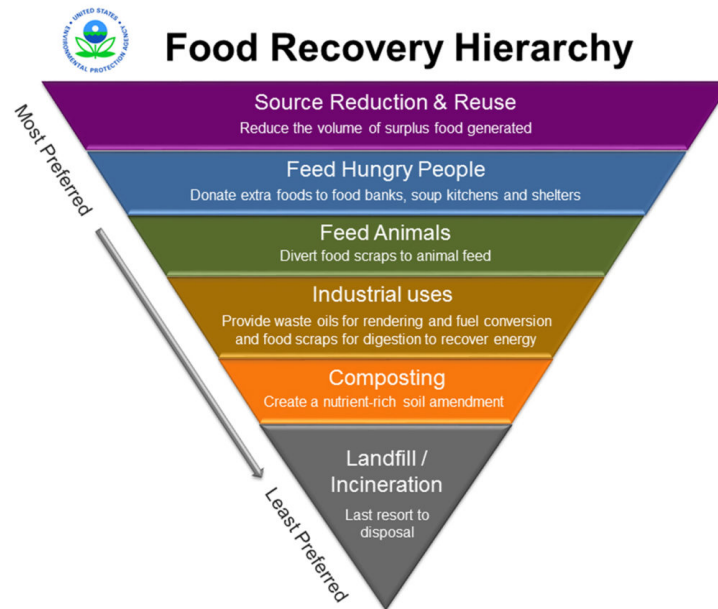


Fig. 1

The Food Recovery Hierarchy is a framework provided by the Environmental Protection Agency (EPA) that presents levels at which food waste could and should be reduced- the top being most important. The most preferred method of waste reduction is Source Reduction and Reuse, as this eliminates, ideally, all waste problems afterwards possible. The next most preferred is Feed Hungry People and Feed Animals. After these, the hierarchy proposes to use the food waste for Industrial uses, such as oils and fuel conversion. The second to last preferable option is composting, and the least preferable option is Landfill/Incineration. These six levels interplay with each other, and thus all should be ideally addressed in order to holistically address food waste, starting from the top.

This proposal is aimed to reduce the overall food waste of Wylie ISD's high schools according to EPA's Food Recovery Hierarchy and is also intended to complement Wylie ISD's Core Values. By actively preparing to dispose of waste responsibly, the student shows respect and a caring attitude towards the environment, giving to both the environment and their fellow students by creating a healthier environment, generating gratitude and celebration for the determination and grit of the students for efforts.

Wylie ISD has already taken great steps to reduce food waste at the source. They have made an effort to only get as much food as demanded, and to reuse extra food from day-to-day. This proposal will aim to build upon the great work already occurring at Wylie ISD and address food waste at every step in the most-preferred way according to the EPA Food Recovery Hierarchy; specifically addressing the Source Reduction & Reuse (via Waste Audits), Feed Hungry People (via after-school programs for post-consumer, unopened food) and Composting food waste that cannot be prevented or donated.

Proposed Solution

Source Reduction

Wylie ISD excels in the area of source reduction, however there are proposed solutions in order to minimize this waste as much as possible. Source reduction is at the top of the food recovery hierarchy, therefore it is critical to expand on these efforts and minimize food waste in this area more. This area of concern is also important due to the fact that attention to source reduction will have the greatest impact on greenhouse gas emissions.

Wylie ISD has further excelled in their previous use of food waste audits. Food waste audits allow for an efficient way for management to understand patterns of what foods are wasted consistently, and possible causes for why these foods are not being consumed. This data can then allow staff to strategize to reduce this waste by potentially altering recipes, changing the menu to cater more to what the students prefer, and even encourage students to eat more balanced diets rather than waste nutritious foods. These audits can also pose as a massive learning opportunity for students and staff at both high schools. Food waste can be seen as a people problem, with only 24% of people saying they are very knowledgeable about reducing food waste (EPA). With the use of these audits, interviews can allow for the audit teams to educate and bring awareness to this global issue. This can potentially cause a domino effect in building campus culture.

A food audit will require a team of trained staff, preferably including champion students, to track food waste during lunch periods. It is also preferable to involve teachers if Wylie ISD hopes to incorporate food waste prevention into curriculum. When performing an audit, it is important to research the menus for the week and arrive early in order to take pictures of these menu items and decide how the buckets of waste will be categorized. An audit station will typically include two main tables (Appendix A). At one of these tables, the food audit team will collect trays from students and interview these students on their waste. The interview process is crucial in understanding the mindset of the students (Appendix B). The second table will be utilized for separating food items into buckets and going forward with the weighing and recording of the waste. The buckets utilized for this process should preferably be clear in order to have students and staff see the issue at hand directly. Directly exposing people to the waste that they are causing can potentially cause them to waste less food in the future. The unopened foods can be redirected to the share table as discussed in the Feeding Hungry People section of the proposed solution. In order for the audit to proceed in a smooth fashion, it is encouraged to use large/animated posters and signs in order to make this process simple and aware to students. Overall, the recommended supplies in order to perform the food audit includes: two tables, multiple five-gallon buckets, scales, posters/signage, clipboards and pens, log sheets/interview sheets, gloves, labels for buckets, towels for cleanup.

In addition to the food audits, it is proposed to utilize “waste not want not” buckets in the kitchen area for the staff and in the cafeteria for students. The clear waste not buckets stationed in the kitchen are utilized for any food scraps caused through the preparation of food in order to be

repurposed before becoming waste (Appendix C). The clear buckets stationed in the kitchen serve as a designated area to keep food scraps and waste in order for the kitchen staff to utilize these scraps to create other dishes before they go to waste. Any food waste that cannot be utilized as an ingredient for other meals should be weighed and recorded so that Wylie ISD can better understand pre consumer food waste associated with food preparation.

Feed Hungry People

Wylie ISD high schools should implement the share tables that have already been instituted in elementary schools in the district. The share table is a table in a central location where students can put unopened drinks, packaged foods, and fruits. This will be implemented alongside the establishment of the food waste hubs discussed in the Composting section of this proposed solution. Any student can take from the share table, and at the end of the lunch period, the remaining food on the share table can be stored and made available for after-school activities. Successfully implemented, this will help reduce the students' post-consumer waste, raise awareness of just how a student is eating lunch, and support a sense of community. To avoid confusion, signs should be placed clearly stating what can and cannot be shared on the share table, a log should be kept to keep track of what food is left over from the lunch period, and faculty/staff should do their best to ensure all students and other faculty/staff are aware of the program. Please reference guidelines for the share table for detailed information (Appendix D).

Under national law, suppliers of food donations are protected from liability if donated with good intentions. Please reference the Emerson Good Samaritan Food Donation Act (Appendix E). Section C1 states the following: "A person or gleaner [a person who harvests for free distribution to the needy] shall not be subject to civil or criminal liability arising from the nature, age, packaging, or condition of apparently wholesome food or an apparently fit grocery product that the person or gleaner donates in good faith to a nonprofit organization for ultimate distribution to needy individuals."

Currently, there is only one food bank in the Dallas area that is willing to collect donations daily: 5 Loaves Ministry. They are stationed at 4401 Williford Road in Sachse, TX. Therefore, they can be integrated as a partner with Wylie ISD further down the line.

Feed Animals

The third most preferred method for addressing food waste is to feed animals. Any viable and nutritious scraps of food from people's kitchens, restaurants, leftover uneaten food, should be saved and given to animals. Mostly, this practice would be for farm animals such as feeding pigs "slop" or scraps from the table. According to the Food and Agriculture Organization of the United Nations, an entire 26-33% of the Earth's land is used for livestock and grazing land for livestock. If more effort was made to use scraps to Feed Animals, then perhaps this significant percentage of land could be reduced.

Although we do not believe that it is possible to divert food waste for animal feed with the initial proposal, we are providing information so that Wylie ISD can reference best practices for diverting food waste for animal feed if the opportunity arises in the future. With proper implementation, it could be useful for restaurants and schools to band together and have sufficient scraps for local farmers. There are several small home based farms within a 25 mile radius that could benefit from food scraps. Some of those are “Green Family Farms, Lucas, TX (10 mins), Buck Creek Meat, Fairview, TX, (20 mins), and the Fisher Family Farm & Ranch Dallas, TX (30 mins). Before transporting any food scraps to these farms it would be important to coordinate dates and times with other food companies to avoid unnecessary transport back and forth which would defeat the purpose.

The United States Environmental Protection Agency compiled state regulations for feeding scraps to animals. It would be beneficial for Wylie ISD to become familiar with the regulations for the state of Texas (Appendix F).

Compared to other states in the U.S., Texas has a fairly lenient Food Scraps for animals’ policy, especially because there are no treatment requirements unlike some states that require cooking the scraps as treatment.

Composting

Purpose

Composting is the 4th tier of the EPA’s Food Recovery Hierarchy. Implementing a composting program at Wylie High and Wylie East will be a great way to expand on the Shake component of the “Share, Shake and Stack” program and provide an opportunity for students to learn a better way to dispose of food that cannot be put at the Share Table. Through composting with Organix, Wylie ISD will be able to reduce the amount of food waste that is added to landfills and instead allows for unused food resources to be reused as soil.

Examining successfully implemented composting programs, such as those at Mansfield Middle School of Connecticut and Urbana High School of Maryland (Appendix G), we can see that a program that involves a strong educational component, quality assurance of the unused food, and support by the school’s community will be the most successful. The following sections will detail guidelines that follow the aforementioned points of success to begin using Organix for a composting program.

You will best understand how composting will fit into your school culture. Allow yourself to integrate this practice into your existing culture.

Implementation Guidelines

Waste Hubs:

Currently, both Wylie High and Wylie East have trash bins along the halls. The placement of recycling and composting bins will need to mirror this accessibility for students to easily assimilate to the new program. Given the current use of wheeled trash bins, it is recommended that recycling and compost bins be on wheels as well for staff convenience. Accessible waste infrastructure can be accomplished by providing receptacles for all waste streams at main waste hubs and satellite waste hubs along the halls in both schools (Appendix H).

Physical Appearance:

Waste hubs will need to be accessible from all aspects. To ensure this is the case, hubs will require the use of clear signage and differing bin color and receptacle openings. Clear signage will have pictures of the items that go in each bin placed above the opening of the waste bin (Appendix E). Each bin will be colored as follows: grey for landfill, blue for recycling, and green for organic waste. The bins will be organized in the previously stated order inside of the waste hub. Each hub will have clear signage, which will differ based on hub type. The signs can be printed on paper and switched out based on the daily lunch menu items. If this is not a needed feature, the signs can be printed, laminated, and then added to the sign holder. To ensure that tray stacking is confined to the hub as well, the end of the waste hub with the trash bin will have a tray holder attached to it. We recommend that students at Wylie ISD create the tray stacking receptacle.

The openings of each receptacle will differ as follows: organics/compost will be a square, recycling will be an oval with a larger center and thinned out top portions, and trash will be a hole. The size of the hole on each receptacle should reflect the amount of waste that should be entering into that waste stream. The recycling receptacle should have the largest hole while the composting should be barely larger than the trash can's. By keeping the opening of the receptacles in differing sizes and colors, students are encouraged to look at what goes into the waste hub. The hub allows for the students to start by shaking landfill items, composting food waste, and recycling before stacking their tray in a holder on the end. This flow of hub use allows for students coming from the lower grades that have gone through waste education to still use the same process they already do while adding an easy to adopt flow for current high school students to use.

Main Waste Hubs:

Waste hubs located in the main cafeteria of both schools and the gym of Wylie High will be central waste hubs, and as such will use 55 gallon cylindrical bins (Appendix I). There are several options for Wylie to make main hubs, two involving reusing old trash bins or mixing old and new waste bins and another that uses a premade hub and new bins. One way to reuse old bins is to paint old trash bins the proper color for their new waste stream, place three of them next to one another, with signs behind or next to bins as seen in (Appendix I) Alternatively Wylie can only reuse trash and recycling bins and purchase composting bins. The waste hub can be condensed through the use old or new bins placed in a bin holder created by the students (Budget).

Satellite Hubs:

To mirror the accessibility of the current hallway waste system, the creation of satellite waste hubs is needed. Satellite hubs will have the same waste stream organization as the main hubs and will differ only in form factor and bin shape used. This makes the work for the custodial staff more accessible as the waste hubs will all be the same as their current waste program functions, and the use of smaller bins throughout the halls allows for the staff to more easily lift the waste into their secondary containers than if all 3 waste streams were constantly offered. The use of wheeled hubs is crucial as this allows the custodial staff and volunteers to place the waste hubs in the best locations for their optimal use. An alternate option would be using 3-in-1 landfill/recycling/composting bins (Appendix I, (Budget).

Wylie has two ways to get these hubs: purchasing pre-made bins online or by working with campus workshop classes to build waste hubs. The use of on-campus resources will be the lowest cost option to Wylie, but the use of pre-made hubs grants an aspect of professional presentation that may play a part in student decision to use waste hubs (Budget). Regardless of which option is chosen, the hubs will require monitoring. The following section details how to ensure that student hub use minimizes waste contamination and that the procedure fits well with the current “Share, Shake, Stack” process.

Controlling the Process:

The success of the composting program rests on having uncontaminated compost. To achieve this, an easy to follow workflow should be established. Since students are already familiar with the share/shake/stack process, we can easily build upon that to create this:

1. Share
2. Shake - landfill
3. Salvage - compost and recycle
4. Stack

We propose adding a salvage step into the original process in order to frame it in a way that encourages students to be more mindful of their waste. Instead of just shaking their items into the trash, they are now looking through their waste, salvaging the items that have a second life, and then properly disposing of waste. By ensuring that items are salvaged, contamination is reduced. The new salvage step can also be combined with an AHMO or pirate themed campaign to rally students around it (e.g. “AHMO Salvage!”).

The new process will progress as follows:

1. The **share** process will continue as before with a designated area for students to place their unopened, packaged food.
2. The **shake** process will now involve two additional steps (composting and recycling) and will be renamed the **salvage** process. First, the student should shake

off all their landfill items (non-recyclable and non-compostable), to prevent contamination when they dispose of compostable and recyclable items.

3. For the **salvage** step they should:
 - a. Salvage their compostable items by shaking them into the composting bins. Very clear signage will need to be implemented with composting do's and don'ts (see Appendix F for a sample image).
 - b. Salvage their recyclable containers that have now been emptied of landfill and food waste.
4. Finally, the **stack** process will continue as before. Students will be able to place their Styrofoam trays into a stacking rack attached to the waste hubs.

As noted earlier, the success of the composting program relies upon minimizing compost contamination. Thus, a strong monitoring program will need to be established to make this program effective. To guide students to adhere to a new program there will need to be student, staff, and parent volunteers stationed at the main waste hubs and patrolling hallways. These volunteers will monitor what students put into each bin and give feedback to students not following proper disposal habits. Student food waste champions can also aid in the monitoring process. Recruitment for these champions could come from environmental clubs or classes and is further discussed in the Education section.

Ultimately the easiest way to fully control the process of composting is to remove potential contaminants from the waste stream. This was the solution that the University of Texas at Dallas used in their dining hall. To ensure that students wouldn't add contaminants, the dining hall stopped offering any type of disposable items in the dining area, except for napkins because they are compostable. For this reason, the Student Union at the University does not offer composting to students as waste streams are poorly cared for by the students and there are inadequate resources to actively monitor waste hubs. Currently the dining staff at the university are attempting to find ways to replace all disposable materials with compostable ones in the Student Union so that composting is easier to add to the dining area.

The Road to Implementation:

To help with community engagement with the composting program, the culture of each school should be examined. Consider what school spirit or shared core value among the student and staff populations would allow for Wylie ISD to create support for composting. For a program to be effectively implemented, it must be marketed to a target audience just as well as it is designed to meet the needs of a target audience. By examining the shared values, or social contexts, of a school a marketing campaign can be created. This will mean creating posters and any kind of media that can be passively interacted with that can represent the core idea of composting while appealing to the social contexts of each school.

The core idea of composting, like recycling, is that we are aware that we have wasted something and that we need to take special action to ensure that our waste is used properly.

Composting, then, aligns with all of the core values of Wylie ISD's nine weeks periods. The school community takes responsibility for their food waste so they can respect the planet. By composting, wasted food can at least be used as soil to care for the needs of crops, giving North Texas more food and plant life. By taking the time to sort waste and to ensure that food waste is not contaminated with other waste types, school communities show grit by not going for the easier option of throwing all waste into one can. Taking the time to sort waste also shows that students and staff are prepared to take responsibility for their waste and are ensuring they prepare a better future by making environmentally focused choices. Finally, this allows for the school community to be grateful the actions they have taken will have a positive impact and to celebrate that they as a group were able to attempt a positive change.

Though Caring & Giving and Gratitude & Celebration are good angles to approach appealing to the Wylie ISD core values, there is caution that must be taken in how the messages are presented. Again, Wylie ISD wants to reduce food waste as much as possible. Presenting composting in too positive of a light can undermine the desire to reduce food waste. By using the Respect & Responsibility period to focus the presentation of the composting program as a part of a greater food waste reduction strategy, then the Caring & Giving period can be used to build on the idea that composting, if necessary, is a positive choice to make. It is also important that the Gratitude & Celebration representation of composting be focused more on gratitude for being able to make choices that they can celebrate rather than that the action of making food waste, even if composted, is remotely cheery. Besides Wylie ISD's Core values, there will also be school specific social contexts that can extend these core values further.

Repurposing or remodeling current school spirit materials that align with the Wylie ISD Core Values to fit the message of food waste reduction and weaving compost education into those materials will prove the easiest way to integrate the composting program into the community of each school.

During the last 9-week period of the Spring 2020 school year, we recommend that students and staff are informed of the intended plan so that they are prepared well in advance. This can be achieved by hosting a Pep Rally to help get the students riled up and excited to continue with implementation into the next semester. You could also have your chosen Environmental Leaders visit classrooms and give presentations within the last few weeks/month of the Spring Semester. Posting the waste stream signs near current locations leading up to the end of school allows students to be familiar with the signs and be aware of needed changes to their current waste habits. However, some minor enforcement for recycling by custodial staff and student volunteers may aid in student behavior changes in the semester leading up to implementation. To aid in student awareness, announcements for the composting program should begin as a quick message every other week until the final week of school, when it is mentioned with a school pride type message twice that week. The last 9-week Wylie ISD Core Values are Gratitude and Celebration. This can be incorporated into the composting program by encouraging students to show gratitude to the resources in the world around us and reminding them that recycling and composting allows us to sustainably maintain our resources.

Appendix E contains some sample templates that Wylie ISD can use on central and satellite waste hub banners. We would encourage that the final signage reflects each school's culture. Some methods to gain design ideas are to create a design contest or to enlist students in art or Photoshop classes.

Project Maintenance:

Organix will provide monthly compost weights and will call to notify Wylie ISD if there are contaminants. These weights and contamination calls from Organix will provide a way to monitor the activity of the program. The ultimate goal of the EPA's Food Waste Hierarchy is to reduce waste as much as possible. As such, the weights received from Organix should decrease with time and decay fully. Wylie ISD will need to examine the extent of compostable food waste at their high schools and decide ways to reduce this further. The food audits that Wylie currently conducts are recommended to continue and it is recommended these audits become more frequent to ensure quality assurance. Ensuring that the community is informed about waste habits and an estimated overall cost of the composting program is included in the budget below.

Education

When it comes to educating students, we run into minor gaps that keep our audience from fully understanding why we are doing the things we are doing. We want to educate Wylie ISD about food waste. This is a district that grew on the foundations of community involvement and their mission statement includes "sustaining a level of excellence in all operations." While there are some practices already being implemented (such as Share-Shake-Stack and helpful posters around campus), we believe we can build upon the progress that has been made.

The current Share-Shake-Stack plan has made great strides in managing food waste and with recommendations, it will continue to eliminate food waste. The biggest modification is the implementation of the Salvage step, which used to be referred to as Shake. The new order would go Share-Shake-Salvage-Stack. The salvage step involves composting and recycling. This suggestion will have the students connect to their waste and allow them to become more conscious. Specific steps are included in the section aptly named **Controlling the Process**, located under **Composting**.

For Wylie ISD to become a leader in food waste management, we must understand the basics of why and how. Without understanding why, we become oblivious and follow along blindly to current practices. We need to provide a clear reason as to why we are implementing this plan and show the students that we are doing this for the greater good of the environment. If everyone were to be selfish about how they take care of the environment, there isn't going to be one to live in. We need to set positive examples, by being good role models and being enthusiastic. And with that in mind, it brings a sense of caring to their young minds that we seek to make a change. These include continuing current practices, being aware of informational posters and

where hubs are, and developing new practices, including looking to the EPA and WWF as a guideline for how to control Food Waste.

Every nine weeks of the academic calendar, the district engages and focuses on key core values. Students and staff alike spend lots of time being exposed to the initiatives around these core values. The four weeks core values are as follows, respectively: ***First Nine Weeks-*** Respect & Responsibility, ***Second Nine Weeks-*** Caring & Giving, ***Third Nine Weeks-*** Grit & Preparation and ***Fourth Nine Weeks-*** Gratitude & Celebration.

Regarding the First Nine Weeks, Respect and Responsibility, these are important traits for the students to possess. If they are respectful to their environment and understand that each individual has a responsibility to take care of the planet, then the planet can prosper and thrive for generations upon generations. We are all living on this planet, so having each individual be aware of how their actions affect the environment is a big step in the right direction.

The Second Nine Weeks focus on Caring and Giving. These are also crucial values to instill in the students, as one must be passionate about what they want to fight for in order to bring upon change. Once you allow someone the opportunity to care, they will then become more receptive to giving back to the environment and community.

The next Nine Weeks highlight the characteristics of Grit and Preparation. As students develop the courage to speak out against food waste practices and problems with the environment, they become more impassioned and have a greater opportunity for the environment to thrive. They can then prepare how they'll be able to sustain their new practices and incorporate them into their everyday lives.

The final and Fourth Nine Weeks key values are Gratitude and Celebration. Students have now adopted the previous traits and can reflect on how this experience can shape their futures. They would be more inclined to be thankful for their surroundings and what is accessible to them. Once this plan has been implemented and students have become dedicated to this cause, they're able to celebrate the achievements and strides made; no matter how big or small.

The current practices include Shake and Stack, Mega Lunch, and in 2017, Wylie ISD's Sustainable Materials Management Program began to accept the EPA's Food Recovery Challenge. The Share, Shake and Stack was implemented in elementary and middle schools and bringing it to the high school level would continue the sustainable development goals. The Mega Lunch is a great idea, as the extended time for lunch allows students to socialize and be more conscious about their food waste and recycling habits. The EPA's Food Recovery Challenge is defined as "organizations pledge to improve their sustainable food management practices and report their results." The Food Recovery Challenge seeks to "reduce the environmental impact of materials through their entire life cycle. This includes how they are extracted, manufactured, distributed, used, reused, recycled, and disposed."

Next, we can set into motion new practices. One helpful implementation would be Food Lesson Plans and Food Awareness week. They can either be part of electives or once a month spotlight on a sustainability issue. It'd be great to look at other schools and create events and make it a week-long event. A competition between high schools would be encouraged.

We also recommend creating Wylie Environmental Activist. Each school would create application and interview students on the new program. You could connect with the Career and Technical Education staff and Environmental Science class to reach more individuals and help garner encouragement. We would ask high school principals and teachers about students who are recognizable and seen as positive role models on campus. Along with this, each school could film a short commercial with them and share it among both high schools. These students would have to be passionate students to mentor and give presentations. They would be the ones to stand at the Food Hubs and encourage student participation. You of course know your students best, and you would be better suited to see who would be a good champion and advocate. The leaders could then start a Sustainability Club and/or Environmental Club and team up with The University of Texas at Dallas. Not only will UTD help, but the Eco Reps as well will absolutely advise and mentor if requested. These students would have to be passionate students to mentor and give presentations. They would be the ones to stand at the Food Hubs and encourage student participation. These are just a few ideas, but we encourage you to connect with your staff and students to how you best believe the message will be received? Would they listen to the commercials? Be more encouraged if their mascot was leading by example? If yes, you could shoot a commercial with your Raider and some Environmental Champions showing students how to use the Hub System and possibly include a comical approach where a student incorrectly used the Hub System or simply doesn't care, and your Raider lassos them in order to take them to jail or detention or have them "walk the plank."

An added practice would include becoming a Food Warrior according to the guidelines of the World Wildlife Foundation (WWF). There is a plethora of resources provided on their website. In order to be a WWF Food Warrior, students and staff must be aware of the challenges and importance ahead of them. The WWF Food Waste Warrior Starter Pack states all of this (Appendix J). They include statistics on food waste, how it affects the environment and the organisms and species in it. Desired Purposes and Objectives are presented in a clear manner. There are details on important vocabulary to know, and a 3-Step process on implementing the program, respectively, (1) Introduction and Preparation, (2) Activity-Conducting the Food Waste Audit and (3) Wrap-up and Conclusions. Other helpful tools include numerous activities and lesson plans (Appendix K).

It comes to the point of how to educate the individuals and we create plans to inform them. We must first teach the individuals how to use this and make it known. Once this becomes imbedded into their minds and they learn to make these small changes it will become a part of their culture. We have planned to come up with a few mnemonic devices that are already apart of Wylie High culture such as the AHMO we have decided to try to make it mean something.

We also would like to provide a survey to the students about how they can begin to think about food waste in their everyday lives and not just at school. A survey would provide us with information such as how much do the students know about food waste, what current practices they are adopting and what they would be willing to participate in the future (Appendix L).

Below there are posters to be used around campus (Appendix M). Students and staff may elect to create their own posters, as to reflect the school culture.

Budget

Item Description	Link	Quantity	Price	Item Justification	Item Total
Common Items (Upfront Fee)					
50 Gal Compost Bin	https://www.webstaurantstore.com/rubbermaid-fg9w2700gray-brute-50-gallon-gray-rollout-trash-container-with-lid/690FG9W2700G.html	8	63.48	For food waste collection at Food Waste Hubs	507.84
Food Weighing Bins	https://www.homedepot.com/p/The-Home-Depot-5-Gal-Homer-Bucket-05GLHD2/100087613	10	3.48	Buckets for food waste weigh-ins	34.8
TOTAL/School Serviced					542.64
Pre-Made Solution (upfront cost)					
3-in-1 compost/recycling/trash bins	https://www.amazon.com/CleanRiver-Recycling-Separate-50-Gallon-Grey-FX50B-GY3-WR-C/dp/B077KDM7ZK	10	334.95	For pre-made compost / recycling / landfill bins	3349.5
Standing Banners	https://www.staples.com/services/printing/custom-banners/banner-stands/	10	99	Clear signage adjacent to satellite hubs	990

24 x 36 Floating Signage - Double Sided	https://www.staples.com/services/printing/hanging-signs/	2	29.99	Clear signage above main waste hubs	59.98
TOTAL/School Serviced					4399.48
Workshop Solution (fee depends on solution provided by woodshop classes)					
Clip-On Signage Small	https://www.officedepot.com/a/products/167198/Deflecto-VersaGrip-Sign-Holder-With-Large/	6	9.99	Clear signage above waste disposal holes \$9.99 / pack of 5 Want 30 total, as 3 per satellite hub for 10 total satellite hubs	59.94
Plywood (4 ft. x 8 ft. Sheet)	https://www.homedepot.com/p/15-32-in-x-4-ft-x-8-ft-BC-Sanded-Pine-Plywood-201429/100012720?MERCH=REC--rv_nav_plp_rr--NA--100012720--N	6	23.15	2 sheets for front and back and one sheet for backboard of main hubs	138.9
Plywood (4 ft. x 4 ft. sheet)	https://www.homedepot.com/p/3-4-in-x-4-ft-x-4-ft-BC-Sanded-Pine-Plywood-1502208/205999854	4	23.83	2 sheets for front and back of satellite hubs	95.32
Plywood (2 in x 4 in x 8 ft. Stud)	https://www.homedepot.com/p/2-in-x-4-in-x-92-5-8-in-Prime-Whitewood-Stud-569062/202091224	44	2.58	Needed for frames for Waste hubs	113.52

Wheels	https://www.homedepot.com/p/Shepherd-3-in-Polypropylene-Swivel-Plate-Caster-with-210-lb-Load-Rating-9394/100154979	48	5.06	Needed to make hubs moveable	242.88
Hinges	https://www.homedepot.com/p/Everbilt-3-1-2-in-x-5-8-in-Radius-Satin-Nickel-Door-Hinge-Value-Pack-12-per-Pack-16909/202045487	4	24.98	4 per waste hub to make doors for bin access.	99.92
20 Gallon Rectangular Bins	https://www.webstaurantstore.com/lavex-janitorial-23-gallon-black-slim-trash-can/475WH23BK.html	30	17.45	3 of these bins in each wooden DIY satellite hub	523.5
TOTAL/School Serviced					1273.98
Compost Hauling Services					
Compost Hauling	Quote from Organix Recycling	1	70	Amount for Organix to stop at the schools each week	70 *
Compost Hauling	Quote from Organix Recycling	3	22	Amount per Ton to Haul Compost to Organix each week	66*
Waste Bins for Collection Behind Schools	Organix	2	200	Collection Bins that Organix will use to pick up waste from. One-time fee for the use of	400

				the bin.	
55 gallon Compost Liners (80)	ECOSAFE	4	71.85	For Organix compatible composting liners	287.4**
20 gallon Compost Liners (165)	ECOSAFE	3	69.36	For Organix compatible composting liners	208.08**
ANNUAL TOTAL/SCHOOL SERVICED					5927.48 ***

*See Composting Hauling Services Monthly Breakdown.

**Calculated assuming 176 days in the school year (2020-2021), that two 55 gallon and two 20 gallon liners were used per day.

**Calculated by using the Annual Total from the Compost Hauling Services Monthly Breakdown and cost of.

Compost Hauling Services Monthly Breakdown		
Month	Service Weeks per month	Price per month (3 tons/wk.)
Aug	3	408
Sep	4	544
Oct	4	544
Nov	3	408
Dec	3	408
Jan	4	544
Feb	4	544
Mar	4	544
Apr	4	544
May	4	544
ANNUAL TOTAL	37	5032

Metrics

Source Reduction

All pre-consumer food waste should be weighed prior to disposal and success of source reduction efforts will be assessed according by monitoring pounds of pre-consumer food waste.

Feeding People

All shared items will be tracked via the share table leftover log and success in addressing food waste at the “Feeding People” level of the Food Recovery Hierarchy will be assessed according to the number of items that are shared with students.

Composting

Using the weights sent by Organix for hauling purposes, pounds diverted can be measured as the weight of the food waste given by Organix. A more robust metric of waste diversion would be a diversion rate estimate. To create a diversion rate estimate, several methods are available. First would be to contact Wylie’s landfill hauler to ask for trash weight. Next, use this equation:

$$\frac{\text{Pounds of food waste given by Organix}}{\text{Pounds of food waste given by Organix} + \text{Pounds of trash weight}} = \text{Diversion Rate estimate (from haulers)}$$

Another method for creating a diversion rate estimate would be to conduct a waste audit of both trash and food waste on each campus and to use the following equation:

$$\frac{\text{Pounds of food waste given by Organix}}{\text{Pounds of food waste given by Organix} + \text{Pounds of trash weight}} = \text{Diversion Rate estimate (from schools)}$$

Updating each school's food waste diversion rate monthly will keep an up-to-date picture of how each school is adopting the composting program. Through contamination calls from Organix, each school will be able to ensure that students know when they have made a mistake in food waste handling. This then allows each school to make announcements or to change signage as needed to reflect the habits of the school's students.

Education

In order to track Education, we will provide a survey that will address food waste concerns and current practices of the students and staff (Appendix J). It will be provided to the students within the first week of class. Once surveys have been returned, results will be analyzed and applied accordingly to the food waste proposal.

Appendix

Appendix A - Food Waste Audit Sample Forms (Interview Questions and Weight Log)

Type of Food (one item per line)	Loss Reason ("didn't like it" is not enough detail)	Optional (if time permits): ideas to reduce food waste

Weight of empty bucket: _____

Number of trays: _____

	Food Type	Weight (Include weight of bucket)
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____

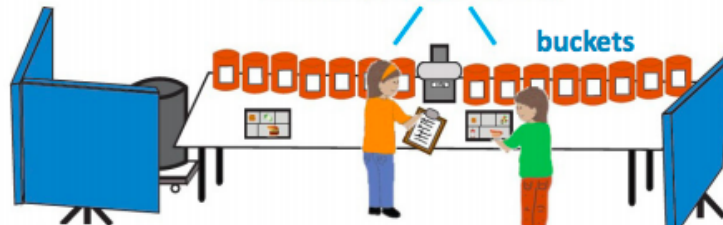
Appendix B - Sample cafeteria setup for food waste audit

Sample cafeteria setup for audit

Step 4: Team leader directs students, empties trash, and acts as a support.



Step 3: Food separators take the tray from the table over to the back table and start separating out the food.



Step 2: Interviewer notices what food was not finished and interviews the student.



Step 1: Students drop off their tray.

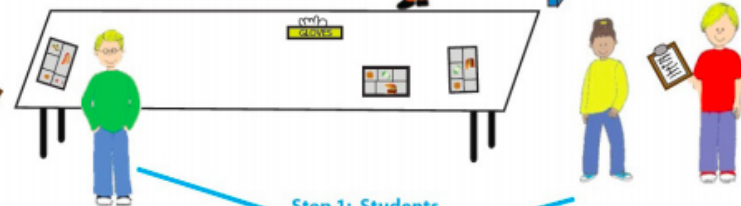


Diagram by Stephen Sturdivant, U.S. Environmental Protection Agency

Appendix C – EPA Food Waste Log Book and Instructions

Waste Logbook – Facility: _____



Pre-Consumer Food Waste should be tracked every day. Every item thrown away by foodservice workers should be recorded on either a paper logbook or with an automated food waste tracking system.

1. Track pre-consumer food waste at the time of discard. Record waste on the logbook immediately prior to placing it in the trash, compost or garbage disposer.
2. If donating food to a food bank, record all food donations on the waste logbook immediately prior to donation (or placing in the donation holding area).
3. Record the type of food and the reason why it is being discarded on the logbook. These are the two most important pieces of information that will reveal opportunities for change.
4. Record how much is being wasted.
5. If you have a scale, the best option is to place the food in an empty bus tub and weigh the waste. Record its weight in the logbook (including the weight of the bus tub). Later, a manager can subtract the known tare weight of the bus tub.
6. If you do not have a scale, record the number of portions leftover or the volume (1/2 a pot, 2 gallons, etc.)
7. Chefs and Managers should review yesterday's waste logbook at the beginning of the following day's shift.
8. The top 5 waste items should be discussed with the kitchen team at a pre-shift meeting. Ask the team for ideas to reduce those items.
9. Review progress on the Top 5 items every week until the amounts drop.
10. If you have time, keep an Excel spreadsheet with your daily waste totals (less tare weights) so you can see progress. Alternately, use specialized food waste tracking systems which automate this record-keeping and reporting.

Post-Consumer Food Waste should be tracked periodically, usually once per month.

1. Use a logbook or automated tracking system just like with pre-consumer food waste.
2. Because post-consumer food waste will include many different foods, it will not be possible to track specific foods or loss reasons. Instead, track the total weight of the trash (or another standardized metric such as number of trash cans or number of trash bags).
3. Keep a record of total weight or count of post-consumer food waste in an Excel sheet or automated tracking system.
4. When measuring post-consumer waste, always do so on your busy day and track subsequent measurements on the same day of the week. For example, always do your post-consumer study on Saturday if that is your busiest day. With this approach, you will have comparable data.
5. Make sure to look at the food in the garbage and note any trends. There may be items that customers do not like which should be removed from the menu. In other cases, you may find portions need to be adjusted to avoid waste.

For more information, visit www.epa.gov/foodscraps.

Special thanks to LeanPath, Inc.

Appendix D - EPA Share Table Guidelines

Share Table Program Guidelines for Educators and Cafeteria Monitors

1. When explaining the Share Table Program to students, it is most important to emphasize the need for students to eat healthy and eat their food until they are feeling full and feeling satisfied.
2. Do not pressure kids into using the “Share Table”, but encourage them to place any unfinished and unopened food items on the table for other students to consume.
3. Let them know that they are welcome to take one or two items from the “Share Table” if they are still hungry after eating their own food.
4. Students are not allowed to bring items from home to place on the table. However, any student who is still hungry can eat items off the share table...even those students who ate a lunch from home.
5. Adults are not allowed to eat items from the share table. Share table foods are only for students.
6. If a student requests to take a fruit or vegetable from the share table to eat as a classroom snack later on, they may be permitted to do so. However, school administration and teachers would need to grant prior permission for a “traveling” fruit or vegetable to accompany the student to the classroom.
7. Acceptable items for the share table include:
 - Unopened Pre-packaged items (stored at corresponding appropriate temperature)
 - Cheese sticks
 - Yogurt
 - Applesauce
 - Raisins
 - Craisins
 - Cereal
 - Cold Sandwiches (Deli or PB&J)
 - Sealed foods
 - Cut apples
 - Carrots
 - Veggie dippers
 - Whole fruits (unpeeled) -- oranges, bananas and wrapped apples
 - Unopened milk or beverages
 - Packaged condiments (Ketchup, Mayo, Salad dressing, etc.)

Appendix E - Bill Emerson Good Samaritan Food Donation Act

<https://www.congress.gov/104/crpt/hrpt661/CRPT-104hrpt661.pdf>

Appendix F - Guidance for Feeding Animals

EPA Feeding Animals Guidance

TEXAS	
<p><i>Texas prohibits the feeding of animal-derived waste to swine. Food waste that consists of only vegetable, fruit, dairy, or baked goods waste may be fed to swine by a licensed facility. Individuals may feed household garbage to their own swine without a permit.</i></p>	
<p>TEX. AG. CODE ANN. §§ 165.001, 165.026 (2015); see also TEX. ADMIN. CODE tit. 4, § 55.3 (2015)</p>	
Animals covered	Swine
Definition of “garbage”	<p>“Restricted garbage” includes (A) the animal refuse matter and the putrescible animal waste resulting from handling, preparing, cooking, or consuming food containing all or part of an animal carcass; (B) the animal waste material byproducts or commingled animal and vegetable waste material byproducts of a restaurant, kitchen, cookery, or slaughterhouse; and (C) refuse accumulations of animal matter or commingled animal and vegetable matter, liquid or otherwise.</p> <p>“Unrestricted garbage” includes vegetable, fruit, dairy, or baked goods refuse matter and vegetable waste and refuse accumulations resulting from handling, preparing, cooking, or consuming food containing only vegetable matter, liquid or otherwise. § 165.026 (2015).</p>
Prohibitions	No feeding garbage to swine. Exception for individuals feeding household garbage. § 165.026 (2015).
Licensure	An individual or facility can only feed unrestricted garbage to swine if it secures a permit from the state. But an individual feeding household garbage to his or her own swine need not obtain a permit. § 165.026 (2015).
Enforcement	The commission may suspend a registration or require the immediate quarantine and closure of a garbage-feeding facility if the operation presents a danger to public health or the livestock industry. § 165.026 (2015).
Treatment requirements	N/A
Relevant state regulatory body	Texas Animal Health Commission (§165.001 (2015)), http://www.tahc.texas.gov/ .

Appendix G - Reference Compost Programs

Mansfield Middle School (CT) Composting Program

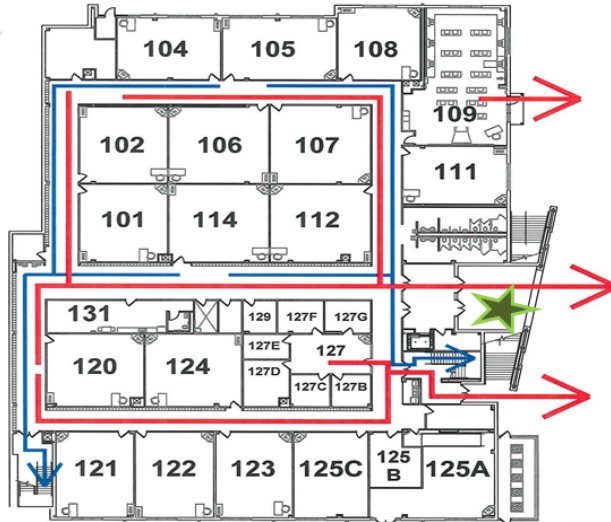
https://www.ct.gov/deep/////cwp/view.asp?q=325380&deepNav_GID=1645

Urbana High School (MD) Composting Program

https://www.fredericknewspost.com/news/education/urbana-high-school-to-try-composting-with-pilot-program/article_27dc16a6-217c-5612-b41a-7dd9c3c5e182.html

Appendix H - Proposed Placements

A-E: Green Circles Represent Central Hub Areas while Green Stars represent the use of repurposed or new waste bins. Small waste hubs can also be used at the Green Star.

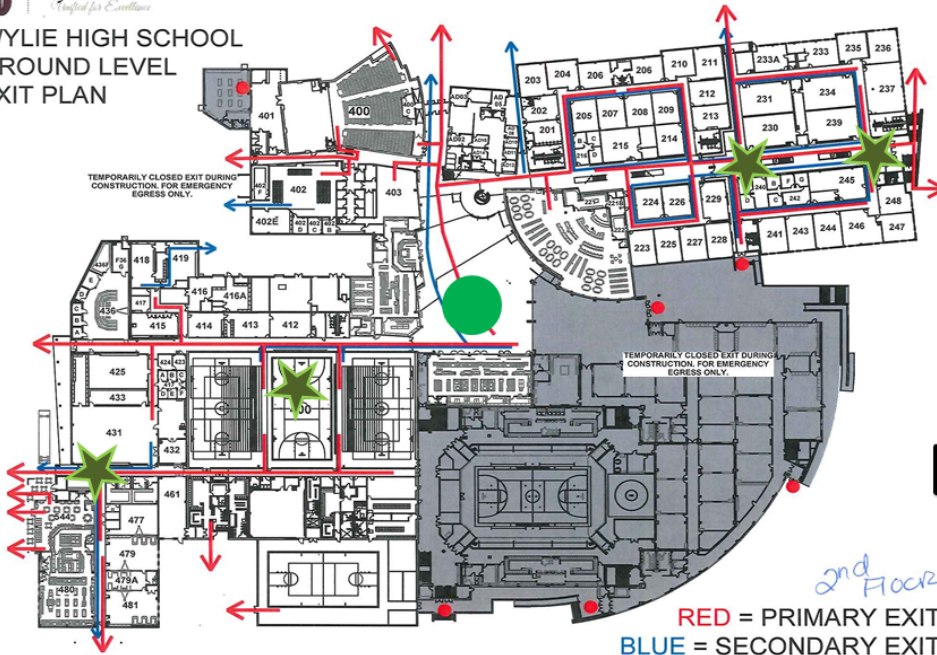


A

RED = PRIMARY EXIT
BLUE = SECONDARY EXIT

WYLIE HIGH SCHOOL
BASEMENT LEVEL
EXIT PLAN *1st Floor*

WYLIE HIGH SCHOOL
GROUND LEVEL
EXIT PLAN



B

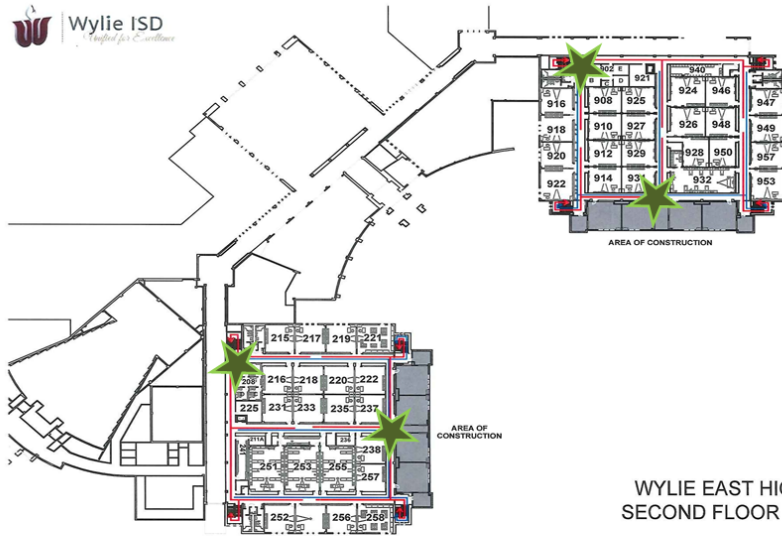
RED = PRIMARY EXIT
BLUE = SECONDARY EXIT



RED = PRIMARY EXIT
BLUE = SECONDARY EXIT

WYLIE HIGH SCHOOL
THIRD FLOOR
EXIT PLAN

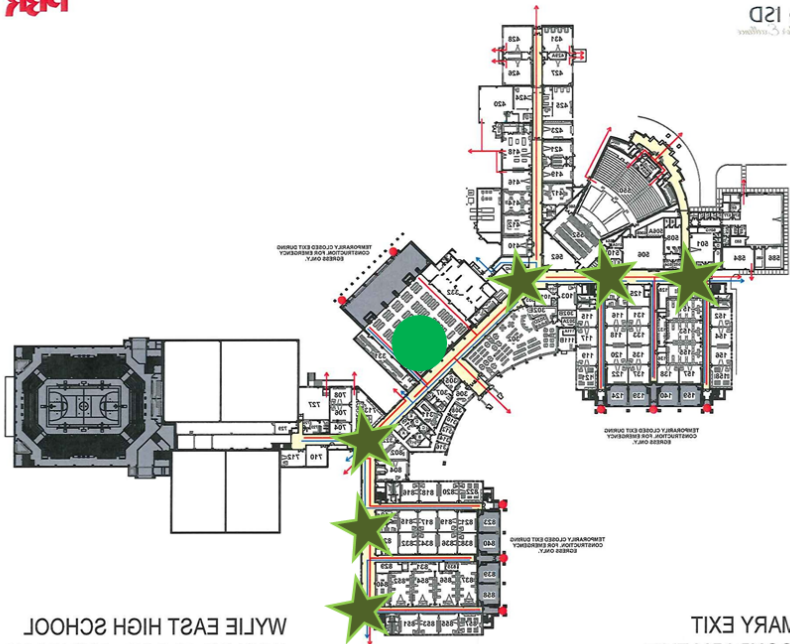
C



D

WYLIE EAST HIGH SCHOOL
 SECOND FLOOR - EXIT PLAN

RED = PRIMARY EXIT
 BLUE = SECONDARY EXIT



E

WYLIE EAST HIGH SCHOOL
 GROUND FLOOR - EXIT PLAN

RED = PRIMARY EXIT
 BLUE = SECONDARY EXIT

Appendix I: Banner Examples

Example Displays in Central and Satellite Waste Hubs:



Example of Banners at the Satellite Waste Hubs:



Source: <https://www.hsph.harvard.edu/ecoopportunity/composting-signage/>

Example of Floating Signage at the Central Waste Hubs:



Waste Hub

Share | Shake | Salvage | Stack

Appendix J: WWF Food Waste Warrior Toolkit

<https://www.worldwildlife.org/teaching-resources/toolkits/food-waste-warrior-toolkit>

Appendix K: Other WWF Initiatives and Lesson Plans

<https://www.worldwildlife.org/initiatives>

Appendix L - Survey

<https://docs.google.com/forms/d/1Jv20dtBQVqmlvs2HUnKdxEqYkH006ixTjRMqBI52veo/edit?usp=sharing>

Appendix M – Food Waste Posters

What Can Be Shared?

- Unopened & unsealed packaged items:**
 - Cheese sticks
 - Yogurts
 - Applesauce
 - Raisins
 - Craisins
 - Cereal
- Sealed foods items:**
 - Cut apples
 - Carrots
 - Veggie dippers
- Whole fruits (unpeeled):**
 - Oranges
 - Bananas
 - Wrapped apples
- Unopened beverages:**
 - Milk
 - Juice
 - Water
- Packaged condiments:**
 - Ketchup
 - Mayo
 - Salad dressing
 - Marinara sauce
 - Parmesan cheese

By 2030:
Let's cut the amount of food we waste in half.

EPA #NoWastedFood

EPA #NoWastedFood

1/3 of all food in the United States goes uneaten each year.
 Let's ensure there's #NoWastedFood:

- Shop your fridge and pantry first
- Get creative with leftovers first
- Store produce properly to keep fresh
- Compost scraps and donate safe and untouched food to local food banks

**Feed Your Body
 Not The
 Trash Can!**

If you **DON'T** open it
DON'T toss it
Share it !

May contain wheat, dairy, soy, peanuts, egg or other allergens

WHAT'S UP WITH ALL THE WASTED FOOD?

CONSIDER THE TOMATO...
 21% of fresh tomatoes bought by U.S. households are thrown away—that's 27 tomatoes a year per person!

Thinking that many households could do better...
 52.3 billion pounds of food is wasted in the U.S. each year.
 That's 1/3 of all food produced in the U.S. household food waste is \$16.8 billion!

WASTED FOOD = WASTED RESOURCES
 U.S. FOOD WASTE ACCOUNTS FOR:

- 25% of all oil, coal, and natural gas used in the U.S.
- Enough energy to power the country for 10 weeks.
- Enough land to feed the world's hungry.

By making small shifts in how we shop, store, and prepare food, we can keep the valuable resources used to produce and distribute food from going to waste.

EPA #NoWastedFood

EPA #NoWastedFood

Reduce wasted food

- Get Less Food**
Buy only what you need
- Feed Hungry People**
Donate extra food to food banks, soup kitchens, and shelters
- Compost**
Compost food waste into rich soil

U.S. FOOD WASTE ACCOUNTS FOR:

25%
of all
our fresh
water use.

Enough
energy to
power the
country for
more than
a week.

Enough
land to feed
the world's
hungry.

