

The Power of ~~Aa~~ Circle: Zero Waste Matters

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The U School

Abstract

This unit focuses on solutions to big environmental problems using the ideas of a circular economy and zero waste goals to offer students opportunities to participate in solutions-based activities towards reducing, managing, recycling or repurposing waste. After completing an overview of these issues from a global perspective-students will engage with local issues, local change-makers and local change-making. This is a ~~problem-based~~problem-based unit with a combination of hands on data collection, group work and independent research and review.

Keywords

Zero waste, circular economy, municipal solid waste, compost, sustainability, sustainable economies, environmental solutions, food waste, carbon cycle, bio-building, green economy

Unit Content

There are many huge and impactful global environmental issues to tackle. This unit will spend no time justifying the need for curricula that challenge students to engage with ~~solutions oriented~~solutions-oriented climate change related content - but rather will consider several interdisciplinary opportunities to connect to ~~ideas, practices~~ideas, practices and people towards fostering an understanding of the human causes of climate change, and opportunities to mitigate and be part of a solutions and change-making. Students will be encouraged and scaffolded to make connections specifically between human actions related to waste and ~~taking action~~acting to participate in solutions.

Nothing is wasted in nature - a tree sprouts, gains energy through photosynthesis and grows, sequesters and stores carbon, feeds insects and birds, drops leaves which decay and feed other organisms, and once dead decomposes to leave behind all its essential elements as energy sources and components of soil. The idea of a cycle explains how much in nature works: the water cycle, the nitrogen cycle, the carbon cycle all detail how elements move through and around our atmosphere, hydrosphere, biosphere, and ~~geosphere, and~~geosphere, and return to be useful again. These cycles are quite different from the linear path of many modern human

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endeavors. We extract resources faster than they can be ~~renewed; produce~~renewed; produce, package and transport ~~goods; use~~goods; use these goods and then throw them away. Years ~~ago~~ago, I learned an adage that there is “no away” (referencing trash which was said to be thrown “away”). Municipal solid waste picked up curbside may seem to be out of sight, and therefore out of one’s mind, but just because you can’t see it in a landfill, or as a pile of toxic e-waste on a beach in poorer parts of our planet, doesn’t mean it isn’t there. With this unit I hope to help my students see some of these places where our refuse goes - including on the streets surrounding our school building —~~recognize~~ recognize the importance of this issue, and feel motivated to play a role in problem solving.

According to the World Resources Institute, “humanity has a waste problem. Globally, we generate about 1.3 billion tons of trash per year, far more than we can properly process or recycle. This leads to environmental tragedies like ocean plastic pollution and geopolitical tensions, as Western countries search for new places to stash their trash.” (Stanislaus, 2018) ~~Stashing~~. Stashing trash would not be needed if humans were required or inspired to interact with our planet’s resources in a way that recognized the impact we are having and took advantage of the embedded energy and inherent value in so much of what we now throw away.

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A circular system would work quite differently. Societies could expect the design, manufacture, distribution and disposal of all that is produced to include a plan for how all the resources and components would be reused, in either a biological or technical cycle. Agricultural waste could be used for bio-building projects or bio-fuel. Large appliances might have worn components swapped out, or be rented to consumers rather than sold, so the owner retains an interest in the proper care and is responsible for reuse. Another idea, suggested by our ~~instructor~~, ~~would~~instructor, would be to ~~require~~ require a service contract on appliances or vehicles which included compulsory buy-back or return to the manufacturers who ~~would~~ would reuse the components, and ~~take responsibility~~ take responsibility for safely disposing of materials that are no longer useful. Homeowners and landlords might pay per trash can, and be fined for commingling recyclables.

This idea that products and services would be designed, manufactured, and distributed and later disassembled into reusable materials and components reclaimed is an idea that has gained ground, and has been named cradle to cradle. There are many groups - businesses, industries, organizations, institutions and individuals with the goal to model nature, throw nothing ~~away~~, ~~and~~away, and to reduce the need for purchasing new commodities, while production and transportation is achieved with renewable energy. This is also called Zero Waste. These ideas both fall within the rubric of a Circular Economy. —A circular economy, as defined by the Ellen

McArthur Foundation is “A systems solution framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution. It is based on three principles, driven by design: eliminate waste and pollution, circulate products and materials (at their highest value), and regenerate nature” (~~Ellen Macarthur Foundation, “Circular Economy Introduction” 2020~~). A version of a systems solution framework is at the heart of what this unit aims to introduce and practice with students, in service of identifying modest local solutions which students can participate in.

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Our youth must be charged to contribute - perhaps as activists and climate communicators, perhaps as problem solvers and engineers - to participate in the changemaking that our planet requires if the Anthropocene is not the final epoch for humanity and many other vulnerable species. The challenge, as many educators reading this unit know, is that the competing priorities in our students’ lives; economic injustice, food ~~insecurity, gun~~insecurity, gun violence and many other traumatic life events can keep students disconnected from school, and the ideas and opportunities that school can offer. Our students who live and go to school in dense poor cities may also be disconnected from the natural world, with limited access to the grandeur and beauty that often inspires environmentalists to act to preserve and protect. If educators can create opportunities to support students to spend time outside, to plant trees, vegetables, flowers and create micro-habitats this human desire to be in nature can be kindled and a passion to participate in life affirming and environmentally sustaining and regenerating activities can be nurtured.

Greening and cleaning a neighborhood not only ~~addresses address~~ blight, ~~water~~blight, water and air pollution issues and disparate heat island effects but also has been shown to dramatically decrease gun violence. Researchers from the University of Pennsylvania partnered with the Pennsylvania Horticultural society to conduct two large-scale studies that intervened to clean and green randomly controlled places in black and brown low wealth neighborhoods in Philadelphia. They found “that after both the greening and trash cleanup interventions, gun violence went down significantly.” (is). Urban farming not only provides some fresh food in a food desert, but provides meaningful work and ~~place based~~place-based learning opportunities. According to the USDA, “urban agriculture allows for the development of a variety of environmental, economic, and social benefits to the surrounding communities. Urban farming can reduce transportation costs, help reduce runoff associated with heavy rainfall, and lead to better air quality.” Reducing food waste and composting helps feed neighbors and friends, builds soil health to grow food and flowers. The socio-political issues are deeply interconnected with environmental issues and climate issues ~~and herein~~and herein lies the opportunity to connect this work with students’ lived experiences. The benefits of being outdoors have been shown in myriad studies to have physical and mental health benefits. According to Richard Louv, author of Last Child in the Woods “Nature is not only nice to have, but it’s a have-to-have for physical health and

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cognitive functioning.” (White et al., 2019). A study of 20,000 people, reported on in the journal Nature led by Mathew White of the European Centre for Environment & Human Health at the University of Exeter, showed that people who spent two hours a week in aggregate in parks and green spaces — were much more likely to report good health and psychological well-being than those who don’t. (Robbins et. al., 2021)

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Several groups of students I have worked with in Educators for Sustainability programs and Environmental Club have identified trash, dirty streets and lack of green spaces in their neighborhoods as the environmental issue they care about most. Our TIP seminar, Global Environmental Challenges and Potential Solutions dedicated many sessions to the issues of municipal solid waste, e-waste, pollution and the enormity of the scale of the problem and the needed scale of global solutions. The challenges and cost benefits of various engineering and civic solutions to the issues of waste helped me understand more fully just how complex and important these issues are, and how much the average individual who is expected to make decisions at the household level, vote for the politicians who will make decisions at the city, state and federal level, ~~are~~ is unprepared because of their ignorance about the issues and options for possible solutions.

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This unit seeks to offer students several tangible opportunities to participate alongside peers, researchers and environmental activists to be part of solutions to reducing, managing, recycling or repurposing waste. We will spend some time on an overview of the global issue - to learn from what communities around the country and world are doing —~~but~~ but our primary focus will be on local ~~issues,~~ local issues, local change-makers and local change-making. As we work as a class to identify specific issues that impact student’s daily lives, and student led solutions to improve our shared spaces I hope to offer students real-world ~~problem-based~~ problem-based learning experiences.

I teach a unique ~~one-year~~ one-year Agriculture, Food & Natural Resources (AFNR) Career and Technical Education (CTE) program for high school seniors. 20-25 students in this program are rostered to my class for close to 25 hours most weeks. ~~Consequently~~ Consequently, I have many opportunities to help students uncover connections between how food is produced, processed, transported, packaged and sold with the impacts along this supply chain and environmental impacts. There are many places along the food supply chain where waste is an environmental and economic issue - and many potential opportunities to explore changemaking on small and large scale that could have real impact.

The new unit will follow a series of lesson in a unit on Ecosystems and Ecosystem benefits which touches on the value of the environment to humans, and the issues around human impact on the environment. Students would be primed to start considering solutions to the many vast and overwhelming global environmental climate issues. This Ecosystem unit will have covered some of the basics on how nature recycles nutrients, and specifically the carbon and nitrogen cycle, and touched on the basics of carbon farming, composting and regeneration. Another unit that will precede this unit, called the Power of Place, looks closely at systemic environmental justice issues, to also lay the groundwork for the intersectionality of environmental issues with systemic social and political forces.

While the specific goal of this new unit is for my students to explore the concept of a circular economy and the goals of zero waste through the lens of the food system - teachers of other disciplines can use food and fiber or follow another familiar product on its supply chain if that ties into their course planning.

As an Agriculture CTE teacher I have a list of skills and task competencies that align to a particular approved course of study. This unit seeks to aggregate several of the AFNR CIP 1.999 skills and tasks into a comprehensive unit that ties together various facets of agriculture production, food processing and food distribution to make explicit the inherent connections between choices along the agriculture value chain and environmental impacts of this industry. Diverting agricultural byproducts into ethanol production, and food scraps into compost not only helps keeps these natural resources from turning into climate warming gases in landfills, but can be a means to capture embedded energy in a productive sustainable way. Helping students begin to see the practical logic and potential beauty in the cycles of nature, may help them see energy and resources in what others see as trash.

Teaching Strategies

My students (like most classrooms) vary widely in their literacy, their background knowledge of environmental science, their attendance, and their overall motivation to participate. Many prefer opportunities to participate in hands on labs and group projects. Others have poor attendance, but complete complex assignments independently. Most are somewhere in the middle. My strategy to try to engage all students is to offer a wide mixture of overlapping resources and assessment opportunities for each unit. It is also always my goal to introduce a complex issue, and take a lead from the specific group of students in front of me to determine which direction to go. This idea - sometimes called Problem Based Learning- of collectively addressing issues and learning together to create solutions - is ultimately my goal as a teacher for

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most of the units in my classroom. Students are more likely to connect to issues they have opted to address, and I, as the teacher, am available to assist, direct, support, and scaffold their problem solving. Students may not join in actively to work on every issue, but in my experience the idea that students are invited (and expected) to be part of solutions to real-world problems as part of their school day seems to motivate many students when other lessons don't.

This unit has two labs, two ~~problem-based~~ ~~problem-based~~ research & reporting web-quests, an opportunity ~~for independent~~ ~~for independent~~ or small group projects, and direct instruction which can be completed in class, or independently. Students wishing to do the minimum are able to clearly see the competencies we are ~~covering,~~ ~~and~~ ~~covering,~~ ~~and~~ evidence required to meet the bar of completion. Other students could opt to work on a project related to this unit throughout the year, and even turn it into a school based paid internship if they are particularly motivated.

The Power of a Cycle unit will start with a “brain dump” where students will be prompted to share what they know about the food system. Using lessons modified from Johns Hopkins Center for Livable Future’s Food span Curriculum, students will be introduced to the agriculture/food supply chain. Even the word chain implies a linear pathway, which will be a starting place for the conversation of a Circular Economy.

Next students will be introduced to a range of intersecting environmental issues related to global municipal solid waste, and see images and videos of polluted and degraded places around the globe that are a result of our throw away culture.

Students will follow a particular locally produced food from farm to table and detail to get a sense of how even a simple two ingredient product produced 60 miles from where it was purchased is challenging to track. Students will be introduced to food producers and retailers who are making zero waste practices part of their business model. Students will also be introduced to activists and organizations who are working on zero waste/cradle to cradle issues and will explore their recommendations. The group will then choose to create guidelines to review our school cafeteria and food resource room to determine how we can better align our actions as a school community with the goals of zero waste.

Using guided notes students will work with an interactive website that shows how food choices connect to climate change. Students will participate in gallery walk of posters and infographics collected and curated by the instructor and hung around the classroom to detail the environmental impacts at various steps along a supply chain which will reveal some of the major issues around food waste.

Students will reflect on what they learned, what they felt, what they are still confused about. Some aspect of issue of food waste will have emerged in each of these introductory lessons

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We will then dig deeper into specific real-life examples of food waste at various places along the food supply chain - from the producer, the processor and packer, to the retail/supermarket to homes and restaurants using a series of video EdPuzzles, articles and interactive direct instruction slide decks. Students will research the food waste reduction policies of the supermarket their family shops at, and determine the policies and procedures of our school and our school district vis a vis waste. Students will reconsider the food product they researched earlier in the “how many hands touched this food” to think about how each stop along that particular foodstuffs journey could have reduced or eliminated waste.

As a group we will participate in mini waste audit - literally counting, weighing, measuring what is in the bins in our classroom. Students will collect the data, and identify issues/impediments within our classroom and school community to doing a better job managing our waste. In class we will then jigsaw a variety of solution-oriented projects in small groups - and have weekly updates from each team working on waste-related issues. Food waste, recycling/trash, Teracycle and around the school building/wider world. Some students will review info about environmental auditing and cradle to grave analysis and work on revising our classroom “sustainable future buying guidelines.” All will report back to the entire class about what they learned, and a group slide deck with slides from each student/small group will be exhibited.

Students will be charged to identify one or more issue that they feel is important to address. After this exercise students will choose a small piece of the large issue of food and agriculture waste to create their own infographic. Their infographic will answer the questions: Where is this waste produced? How much? Who is working on this issue in Philadelphia/elsewhere? What resources will they need to learn more about this? What images can help tell this story? What are the facts? What are the sources for the facts they used? Were they able to identify an/some solution(s)?

Students will display their infographic drafts as part of a gallery walk for feedback (guided notes will be provided) & take questions from classmates, and along with feedback from teacher, will revise and create a final infographic which looks at one food or agriculture waste issue. This exploration will hopefully help students better understand not only the many issues, but also the many opportunities to implement improvements.

What would it look like for our classroom to have less waste? To recycle properly? To compost? To reduce food waste? Who can help us do this work?

Teacher will curate list of organizations/research/mentors etc. based on student interest and findings. Students will also add to the list of organizations to learn about. Students will contribute to a shared group slide deck - each group responsible for several slides with info about “their” organization, their advice, the impact and strategies required to “green” or “close the loop” on their project.

Students will answer the specific question: is this an organization I can work with or learn from - and if yes, how? They will be asked to follow at least one organization on social media, and connect in some way with this group, and to share back on weekly group “report backs” what “their” organization is doing. What partners do they have? Do they have what they need? Is there a role for students to help? What help do they need?

All students will participate in setting up and managing school-based composting. All students will use agricultural byproducts as a resource building material in a “bio-building lab” which grows mycelia on hemp herds or straw for a bio-brick or bio-packaging material. Students will also take part in a simple bio-fuel lab, making ethanol from sugar cane or sugar beets.

Students will be asked to complete a final project, a “Choose One” project. They will opt to either: review case-studies of curated cradle to cradle food & agriculture products; advise on green purchasing guidelines for our school or district; complete a waste audit and follow-up suggestions for urban agriculture partner or commercial kitchen partner; take on regular tasks to improve waste management in classroom; team up with peers or partner to zero waste product; create a communications campaign to educate about zero waste or food waste, or composting. These projects will include creating a proposal/plan; identifying partners and timeline; and requirements to document for their portfolio any of the Agriculture, Food & Natural Resources (AFNR) competencies that they will cover during this project’s completion. Students are each on their own pathway towards portfolio completion, and so will be guided towards a project that provides them opportunities to create and provide evidence to demonstrate understanding of competencies they require. There are numerous environmental science, biology and earth science standards, which could be covered within this unit, and many of the labs and lessons could stand alone in a range of science classes.

By the end of the unit students will have joined, or started, at least one effort to be a “change-maker” in their school community, and one effort in the wider world around a waste issue that matters to them, in a solutions-oriented framework that they can connect to food and agriculture systems: reducing food waste, repurposing agricultural waste, rethinking how we manage school wide waste. Students will report back on their efforts to their classmates at least twice, and all students will add two slides to a school wide exhibition presentation.

After a month-long exploration of waste students will, hopefully, have a transformed view of how so much of what has been defined as waste can be considered a resource.

Classroom Activities

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The School

The Power of a Circle

AFNR Unit Guide

ZERO WASTE & CIRCULAR ECONOMY

Overview

Overview

Unit Essential Questions: What role does waste play in the global environment? Why does this matter? What is Zero Waste? What might a circular economy look like? Where are opportunities to reduce waste in the food system? What are the organizations and institutions doing this work? How can we participate in solutions to global and local environmental challenges?

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Culminating Performance Task(s): Evidence to Demonstrate Competencies:

AFNR Zero Waste -Portfolio to include:

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Report Back Review of Global Big Issue of Waste

Exploration of Circular Economy - video, reading, web-questing, reporting back

~~Exploration, Food~~Exploration, Food Waste Case Study AFNR Innovation/Iteration Review & Report Back

Lab Notes: -Bio ~~Fuel~~Fuel Production

Ag Innovation Career Exploration Guided Notes

Completion and Exhibition of Zero Waste “Choose One” Project

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Student Activities: Review the Carbon Cycle & How Nature Cycles Energy without WASTE

Activity Type: Direct Instruction

Time to Complete: 40 minutes

Learning & Assessment Tools

Carbon Cycle EdPuzzle

Add to AFNR vocabulary list

SWBAT/CTE Competency: Explain the Carbon Cycle and How Nothing is “Wasted” in Nature

Student Activities: Global Municipal Solid Waste Issues - An Overview

What is our (USA/Humans) role in Global Environmental Issues vis a vis Waste?

How Big a Problem Is It?

Where does our waste go?

What are the major components of MSW?

What about e-waste?

What are some innovative solutions to MSW around the world.

Activity Type: Direct Instruction - Nearpod & Slide Deck & Guided Notes Jigsaw Web-Quest

Time to Complete: 80-120 minutes

Learning & Assessment Tools

Nearpod Municipal Solid Waste

Students will read an article on local waste issue and formulate 3 questions for the group to work on answering together. Small groups of students will each research and report on one MSW “solution”

Student Activities: Intro to Circular Economy, Zero Waste, Cradle to Cradle

Activity Type: Independent Research, Direct Instruction

Learning & Assessment Tools

Rethinking Progress - Circular Economy Video

What is Cradle to Cradle?

Intro to Circular Economy

Circular Economy Short Video EdPuzzle

SWBAT/CTE Competency: Distinguish between circular and linear economy

Explain importance of circular economy to reducing waste and improving environmental impacts of “stuff”

Student Activities: Introduction to the Overall Food System: from field to packing house to processing to market to table.

Activity Type: Direct Instruction

Learning & Assessment Tools: Food Span

SWBAT/CTE Competency: AFNR 102 Identify major segments of the food production & processing industries.

Student Activities: How does The Food System Interrelate to Climate Change & The Environment

Activity Type: Web-Quest, Guided Notes

Learning & Assessment Tools: Food & Climate Change Infographic Assignment & Assessment

Student Activities: Mini Waste Audit -AFNR classroom

Activity Type: LAB

Time to Complete: 120 min (20-30 min/day for a week)

Learning & Assessment Tools: Empty, Sort, Photograph and Measure Waste in AFNR receptacles at end of day for one week. Teams each do one day. Aggregate results

SWBAT/CTE Competency: Predict the results of waste audit.

Add data to shared data set.

Review the results & reflect on the results

Offer suggestions for

Student Activities: Where does Food Get Wasted In this System?

What is Food Waste?

Why So Much Food Waste?

Where is Food Wasted?

Why is Food Waste an Environmental/Climate Change Issue?

Time to Complete: 80-120 minutes

Learning & Assessment Tools: Completed Food Waste Unit Slide Deck (Near Pod with Questions)
OR Complete Digital Notebook:

Food Waste Report Back

SWBAT/CTE Competency: Identify proper waste disposal and recycling methods.

1601

Discuss trends in food production, world population and supply and demand

Student Activities: Mini-Case Study: Mozzarella from Cow to Table.

Activity Type: Individual or small group research

Time to Complete: 30-40 minutes

Learning & Assessment Tools: Complete the Mozzarella Farm to Plate Assignment

SWBAT/CTE Competency: 706 Analyze the ways in which human needs and environmental considerations interrelate for food products.

Student Activities: Food Waste Solutions: Who is Doing this Work?

Connecting Food Waste to Zero Waste in Food Business.

What businesses are doing this work

What are they doing

Activity Type: Facilitated Group Collaboration

Time to Complete: 45-90 minutes

Learning & Assessment Tools: Students Explore Exemplar of changemakers/changemaking: clean incinerators, Israel biogas.

Case study on product used from waste: Avocado Pit Drink, Beer from Bread, Packaging free stores/products etc.

SWBAT/CTE Competency: Create a 4-slide presentation on Your Chosen Product/Business -weekly updates on their activities, projects, initiatives, successes, challenges

Student Activities: Food Waste Solutions that Connect Directly to Agriculture:

Food Waste Hierarchies

Feeding people

Feeding animals (agriculture)

Compost (agriculture)

Activity Type: Direct Instruction Compost

Time to Complete: 40 minutes

Learning & Assessment Tools: Completed Compost near pod AND Food Waste Digital Notebook

Commented [GR18]: You have found some very good resources in these links!

Student Activities: Making Bio Fuel Lab

Activity Type: Lab

Time to Complete: 40 minutes

SWBAT/CTE Competency: 505 Understand how new energy sources are developed from agricultural products (e.g.: gas co-generation and ethanol).

Student Activities: Bio Building with Agricultural Waste Lab

Activity Type: Lab

Time to Complete: 1 hour plus 4 weeks of watching and waiting

Learning & Assessment Tools: Using Agricultural by Products (straw or hemp herds, coffee grounds) and mycelia to grow bio-bricks and/or mushrooms

SWBAT/CTE Competency: Explain how energy embedded in agricultural byproducts is a resource rather than a waste product

Student Activities: What Role Will You Play in Moving Towards Zero Waste at The U School.

Join or Create a Team: Choose One (or suggest another):

Compare and contrast two zero waste food businesses

Review green purchasing guidelines for Phila School District;

Research and Report on Food Waste Efforts of Local Supermarket

Participate & Report on a wider Waste audit of school or one of our AFNR partner

Create a school-based internship to take on regular tasks to improve waste management in classroom;

Team up with peers or partner to create a zero-waste product or side hustle

Create a communications campaign to educate about zero waste or food waste, or composting.

Activity Type: Independent and collaborative Work

Time to Complete: 1 hour/week 4 weeks

Learning & Assessment Tools: Portfolio & Presentation

(weekly reflection, photos etc. of the effort)

SWBAT/CTE Competency: 705 Identify non-governmental stakeholders (state, national & regional) in natural resource management.

Student Activities: Career Exploration -list names of ten jobs/careers in the food waste reduction, composting, zero waste, cradle-to-cradle field. Choose one to dig into and describe.

Activity Type: Independent research- complete guided notes doc

Learning & Assessment Tools: Career Report-Back

SWBAT/CTE Competency: Explain the job and career opportunities in zero waste, circular economy

Student Activities	Activity Type	Time to Complete	Learning & Assessment Tools	SWBAT/CTE Competency
EXPLORE				
Review the Carbon Cycle & How Nature Cycles Energy without WASTE	Direct Instruction	40 minutes	<u>Carbon Cycle EdPuzzle</u> Add to <u>AFNR vocabulary list</u>	Explain the Carbon Cycle and How Nothing is "Wasted" in Nature

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<p>Global Municipal Solid Waste Issues—An Overview</p> <ul style="list-style-type: none"> ● What is our (USA/Humans) role in Global Environmental Issues vis-a-vis Waste? ● How Big a Problem Is It? ● Where does our waste go? ● What are the major components of MSW? ● What about e-waste? ● What are some innovative solutions to MSW around the world. 	<p>Direct Instruction—Nearpod & Slide Deck</p> <p>& Guided Notes</p> <p>Jigsaw</p> <p>Web-Quest</p>	<p>80-120 minutes</p>	<p><u>Nearpod Municipal Solid Waste</u></p> <p>Students will read an article on local waste issue and formulate 3 questions for the group to work on answering together.</p> <p>Small groups of students will each research and report on one MSW “solution”</p>	<p>Formatted: Space After: 12 pt, Line spacing: single</p> <p>Formatted: Space After: 12 pt, Widow/Orphan control</p> <p>Formatted: Space After: 12 pt, Line spacing: single, No bullets or numbering</p>
<p>Intro to Circular Economy, Zero Waste, Cradle to Cradle</p>	<p>Independent Research, Direct Instruction</p>		<p><u>Rethinking Progress—Circular Economy Video</u></p> <p><u>What is Cradle to Cradle?</u></p> <p><u>Intro to Circular Economy</u></p> <p><u>Circular Economy Short Video</u></p> <p><u>EdPuzzle</u></p>	<p>Distinguish between circular and linear economy</p> <p>Explain importance of circular economy to reducing waste and improving environmental impacts of “stuff”</p> <p>Formatted: Space After: 12 pt, Line spacing: single</p> <p>Formatted: Space After: 12 pt, Widow/Orphan control</p> <p>Formatted: Space After: 12 pt, Line spacing: single</p> <p>Formatted: Space After: 12 pt, Widow/Orphan control</p>

<p>Introduction to the Overall Food System: from field to packing house to processing to market to table.</p>	<p>Direct Instruction</p>		<p><u>FoodSpan</u></p>	<p>AFNR 102 Identify major segments of the food production & processing industries.</p>
<p>How does The Food System Interrelate to Climate Change & The Environment</p>	<p>Web-Quest, Guided Notes</p>		<p><u>Food & Climate Change Infographic Assignment & Assessment</u></p>	
<p>Mini Waste Audit – AFNR classroom</p>	<p>LAB</p>	<p>120 min (20-30 min/day for a week)</p>	<p>Empty, Sort, Photograph and Measure Waste in AFNR receptacles at end of day for one week. Teams each do one day. Aggregate results</p>	<p>Predict the results of waste audit.</p> <p>Add data to shared data set.</p> <p>Review the results & reflect on the results</p> <p>Offer suggestions for</p>

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<p>Where does Food Get Wasted In this System?</p> <ul style="list-style-type: none"> • What is Food Waste? • Why So Much Food Waste? • Where is Food Wasted? • Why is Food Waste an Environmental/Climate Change Issue 		80-120 minutes	<p>Completed <u>Food Waste Unit Slide Deck (Near Pod with Questions) OR Complete Digital Notebook:</u></p> <p><u>Food Waste Report Back</u></p>	<p>Identify proper disposal and recycling methods.</p> <p>1601</p> <p>Discuss trends in food production, world population and supply and demand</p>	<p>Formatted: Space After: 12 pt, Line spacing: single</p> <p>Formatted: Space After: 12 pt, Widow/Orphan control</p> <p>Formatted: Space After: 12 pt, Line spacing: single</p> <p>Formatted: Space After: 12 pt, Line spacing: single, Widow/Orphan control</p> <p>Formatted: Space After: 12 pt, Line spacing: single, No bullets or numbering</p> <p>Formatted: Space After: 12 pt, Widow/Orphan control</p> <p>Formatted: Space After: 12 pt, Widow/Orphan control</p> <p>Formatted: Space After: 12 pt</p>
<p>Mini-Case Study: Mozzarella from Cow to Table.</p>	Individual or small group research	30-40 minutes	<p><u>Complete the Mozzarella Farm to Plate Assignment</u></p>	<p>706 Analyze the ways in which human needs and environmental considerations interrelate for food products.</p>	<p>Formatted: Space After: 12 pt, Line spacing: single, Widow/Orphan control</p> <p>Formatted: Left, Space After: 12 pt, Widow/Orphan control</p> <p>Formatted: Space After: 12 pt</p> <p>Formatted: Space After: 12 pt, Line spacing: single</p> <p>Formatted: Space After: 12 pt, Widow/Orphan control</p> <p>Formatted: Left, Space After: 12 pt, Widow/Orphan control</p> <p>Formatted: Space After: 12 pt, Line spacing: single</p> <p>Formatted: Space After: 12 pt, Line spacing: single, Widow/Orphan control</p> <p>Formatted: Space After: 12 pt, Widow/Orphan control</p> <p>Formatted: Space After: 12 pt, Widow/Orphan control</p>
<p>Food Waste Solutions: Who is Doing this Work?</p>	Facilitated Group	45-90 minutes	<p>Students Explore Exemplar of changemakers/cha</p>	<p>Create a 4 slide presentation</p>	<p>Formatted: Left, Space After: 12 pt, Widow/Orphan control</p> <p>Formatted: Space After: 12 pt, Line spacing: single</p> <p>Formatted: Left, Space After: 12 pt, Widow/Orphan control</p>

<ul style="list-style-type: none"> ● Connecting Food Waste to Zero Waste in Food Business. ● What businesses are doing this work ● What are they doing 	Collaboration		<p>Wastemaking: clean incinerators, Israel biogas.</p> <p>Case study on product used from waste: Avocado Pit Drink, Beer from Bread, Packaging free stores/products etc.</p>	<p>on Your Chosen Product/Business - weekly updates on their activities, projects, initiatives, successes, challenges etc.</p>	<p>Formatted: Space After: 12 pt, No bullets or numbering, Widow/Orphan control</p> <p>Formatted: Space After: 12 pt, Widow/Orphan control</p>
<p>Food Waste Solutions that Connect Directly To Agriculture:</p> <ul style="list-style-type: none"> ● Food Waste Hierarchies ○ Feeding people ○ Feeding animals (agriculture) ○ Compost (agriculture) 	Direct Instruction Compost	40 minutes	<p>Completed <u>Compost</u> nearpod</p> <p>AND <u>Food Waste Digital Notebook</u></p>		<p>Formatted: Space After: 12 pt, Line spacing: single</p> <p>Formatted: Space After: 12 pt, Widow/Orphan control</p> <p>Formatted: Left, Space After: 12 pt, Widow/Orphan control</p> <p>Formatted: Space After: 12 pt, Widow/Orphan control</p> <p>Formatted: Space After: 12 pt, Line spacing: single, Widow/Orphan control</p> <p>Commented [GR19]: You have found some very good resources in these links!</p> <p>Formatted: Space After: 12 pt</p>
Making Bio Fuel Lab	Lab	40 minutes		<p>505 Understand how new energy sources are developed from agricultural products (e.g. gas co-generation and ethanol).</p>	<p>Formatted: Space After: 12 pt, Line spacing: single, No bullets or numbering</p> <p>Formatted: Space After: 12 pt, Line spacing: single</p> <p>Formatted: Space After: 12 pt, Widow/Orphan control</p> <p>Formatted: Left, Space After: 12 pt, Widow/Orphan control</p> <p>Formatted: Space After: 12 pt, Widow/Orphan control</p> <p>Formatted: Space After: 12 pt</p> <p>Formatted: Space After: 12 pt, Line spacing: single, Widow/Orphan control</p>

<p>Bio-Building with Agricultural Waste Lab</p>	<p>Lab</p>	<p>1 hour plus 4 weeks of watching and waiting</p>	<p>Using Agricultural By-Products (straw or hemp hurds, coffee grounds) and mycelia to grow bio-bricks and/or mushrooms</p>	<p>Explain how energy embedded in agricultural byproducts is a resource rather than waste prod</p>
<p>What Role Will You Play in Moving Towards Zero-Waste at The U School.</p> <p>Join or Create a Team: Choose One (or suggest another):</p> <ul style="list-style-type: none"> Compare and contrast two zero waste food businesses Review green purchasing guidelines for Phila School District; Research and Report on Food Waste Efforts of Local Supermarket Participate & Report on a wider Waste audit of school or one of our AFNR partner Create a school based internship to take on regular tasks to improve waste management in classroom; team up with peers or partner to create a zero waste product or side hustle create a communications campaign to educate about zero waste or food waste, or composting. 	<p>Independent and collaborative Work</p>	<p>1 hour/week 4 weeks</p>	<p>Portfolio & Presentation (weekly reflection, photos etc. of the effort)</p>	<p>705 Identify non-government stakeholders (state, national & regional) in natural resource management.</p>

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<p>1. Career Exploration – list names of ten jobs/careers in the food waste reduction, composting, zero waste, cradle-to-cradle field. Choose one to dig into and describe.</p>	<p>Independent research – complete guided notes doc</p>		<p><u>Career Report Back</u></p>	<p>Explain the job and career opportunity in zero waste circular economy</p>
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Resources

A Complete Unit Guide with Links to Lesson Resources, Student Materials and Assessments can be found [here](#):

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Additional Resources:

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John’s Hopkins Center for a [Liveable Livable](#) Future: Food Span Curriculum [Unit 1: Meet the Food System - Lesson Plans](#)

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[8 Innovative Smart Waste Management Technologies | BigRentz](#)

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[15 Innovative Solutions To Our Garbage Problems](#)

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[Philadelphia | Vicinity](#) District Energy Solutions

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[The Energy Co-op](#)

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[What is Cradle to Cradle? | SemperGreenwall](#)

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[Barriers to a Circular Economy: 5 Reasons the World Wastes So Much Stuff \(and Why It's Not Just the Consumer's Fault\)](#)

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[Home biogas](#)

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<https://water.phila.gov/pool/files/biogas.pdf>

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[School Composting Options](#)

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[Fertile Grounds: Two Philadelphia public schools demonstrate how to get food waste out of landfills and educate the next generation at the same time](#)

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[Henry Got Crops Video](#) on Composting School-Wide Waste at W.B. Saul High School

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Information and Introduction to tenets of [Problem Based Learning](#)

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References

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Circular economy introduction. (n.d.). Retrieved January 12, 2023, from <https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview#:~:text=The%20circular%20economy%20is%20a,do%20with%20the%20materials%20afterwards.>

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Ecopsychology: How immersion in nature benefits your health. Yale E360. Retrieved December 26, 2022, from <https://e360.yale.edu/features/ecopsychology-how-immersion-in-nature-benefits-your-health>

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South, E. C. (2021, October 8). *To combat gun violence, clean up the neighborhood.* The New York Times. Retrieved December 26, 2022, from <https://www.nytimes.com/2021/10/08/opinion/gun-violence-biden-philadelphia.html>

Stanislaus, M. (2018, May 24). Barriers to a circular economy: 5 reasons the World Wastes so much stuff (and why it's not just the consumer's fault). Retrieved January 12, 2023, from <https://www.wri.org/insights/barriers-circular-economy-5-reasons-world-wastes-so-much-stuff-and-why-its-not-just>

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White, M. P., Alcock, I., Grellier, J., Wheeler, B. W., Hartig, T., Warber, S. L., Bone, A., Depledge, M. H., & Fleming, L. E. (2019, June 13). *Spending at least 120 minutes a week in nature is associated with good health and Wellbeing*. Nature News. Retrieved December 26, 2022, from <https://www.nature.com/articles/s41598-019-44097-3>

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Urban Agriculture. Urban Agriculture | National Agricultural Library. (n.d.). Retrieved December 26, 2022, from <https://www.nal.usda.gov/farms-and-agricultural-production-systems/urban-agriculture#:~:text=Urban%20agriculture%20allows%20for%20the,lead%20to%20better%20air%20quality.>

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Appendix

[Complete Unit Guide with Live Links:](#)

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[CTE Competencies; AFNR CIP 1.999 covered in this unit](#)

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Field Code Changed

[1602 Identify emerging technologies and their impacts on food products and processing.](#)

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[502 Analyze current agricultural environmental challenges.](#)

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[706 Analyze the ways in which human needs and environmental considerations interrelate](#)

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[303 Identify proper waste disposal and recycling methods](#)

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[505 Identify how new energy sources are developed from agricultural products - gas cogeneration and ethanol](#)

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[Competencies: Educators for Sustainability/The Cloud Institute](#)

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[INVENTING AND AFFECTING THE FUTURE](#)

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[The vital role of vision, imagination and intention in creating the desired future. Students will design, implement and assess actions in the service of their individual and collective visions.](#)

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Competencies: Habits of Success (HOS)

HOS 3.2 Seek support and resources

HOS 4.2 Communicate Effectively

CTE Competencies: AFNR CIP 1.999 covered in this unit

- 1602 Identify emerging technologies and their impacts on food products and processing.
- 502 Analyze current agricultural environmental challenges.
- 706 Analyze the ways in which human needs and environmental considerations interrelate
- 303 Identify proper waste disposal and recycling methods
- 505 Identify how new energy sources are developed from agricultural products—gas cogeneration and ethanol

Competencies: Educators for Sustainability/The Cloud Institute

INVENTING AND AFFECTING THE FUTURE

- The vital role of vision, imagination and intention in creating the desired future. Students will design, implement and assess actions in the service of their individual and collective visions.

Competencies: Habits of Success (HOS)

HOS 3.2 Seek support and resources

HOS 4.2 Communicate Effectively

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