



New Jersey Leaves No Bite Behind

climate change education curriculum


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A stylized illustration of a superhero with a blue suit, red cape, and red boots. The superhero's chest features a circular emblem with a green and blue globe. The superhero is standing on a white circular base. In the background, there is a large globe of the Earth with green continents and blue oceans, surrounded by white clouds and white stars. The entire scene is set against a light blue background.

New Jersey Leaves No Bite Behind



RUTGERS

GOAL:

Improve school administrations' and fifth grade students' knowledge, attitudes & behaviors, toward adapting food waste reduction practices.

Project Purpose

FUNDING SOURCE:
NJ DEP
Recycling
Enhancement
Act
FY 2021



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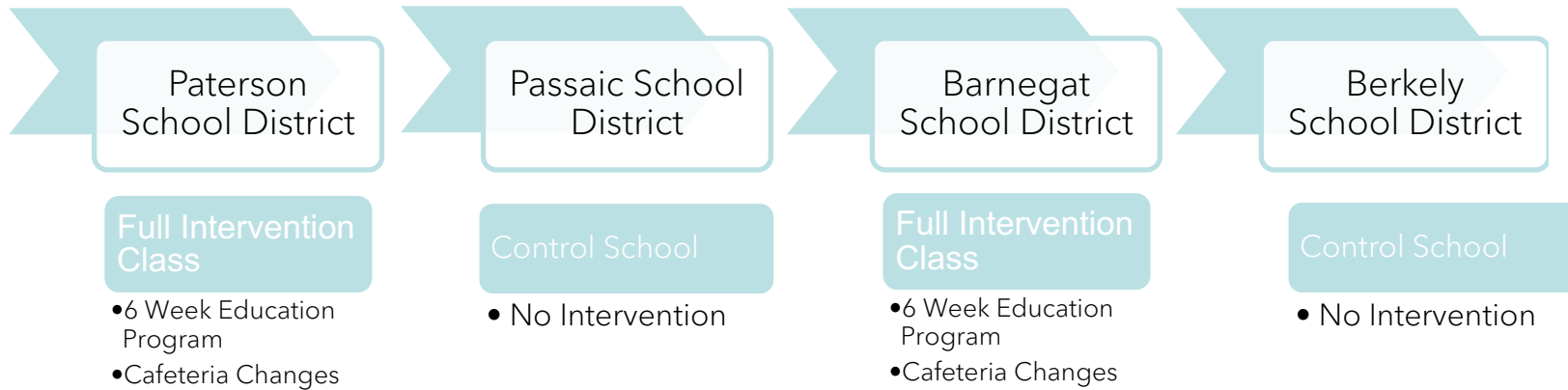
Educational Program for students

Technical Assistance for Administrators with CET



Disseminate knowledge gained to a broader audience.

Study design



LESSON TITLES

1. Essential Earth Knowledge: Atmosphere, Greenhouse Gases, & the Climate
2. Getting to Know the Food System
3. Food Waste in the Food System
4. Environmental Impacts of Food Waste in the Food System & its Solutions
5. Food Miles & Shrinking Your Food's Carbon Footprint
6. Composting: Decomposers Help us Reduce Climate Change!

Alignment with Next Generation Science Standards



NGSS

"Unless otherwise specified, "descriptions" referenced in the evidence statements could include but are not limited to written, oral, pictorial, and kinesthetic descriptions.

5-LS2-1 Ecosystems: Interactions, Energy, and Dynamics

Students who demonstrate understanding can:

- 5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.** [Clarification Statement: Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.] [Assessment Boundary: Assessment does not include molecular explanations.]

The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Developing and Using Models Modeling in 3–5 builds on K–2 models and progresses to building and revising simple models and using models to represent events and design solutions.</p> <ul style="list-style-type: none"> Develop a model to describe phenomena. <p>.....</p> <p>Connections to the Nature of Science</p> <p>Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena</p> <ul style="list-style-type: none"> Science explanations describe the mechanisms for natural events. 	<p>LS2.A: Interdependent Relationships in Ecosystems</p> <ul style="list-style-type: none"> The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. <p>LS2.B: Cycles of Matter and Energy Transfer in Ecosystems</p> <ul style="list-style-type: none"> Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. 	<p>Systems and System Models</p> <ul style="list-style-type: none"> A system can be described in terms of its components and their interactions.

Lesson Plan Outline

Science and Engineering Practices

For this lesson, students are engaged in the following Science and Engineering Practices:

Obtaining, Evaluating, and Communicating Information:

Obtain and combine information from books and/or reliable media to explain phenomena or solutions to a design problem.

Cross Cutting Concepts

Systems and System Models (4) – *Earth’s atmosphere is a unique and important part of the earth’s climate system and is influenced by our food system.*

Cause and Effect (2) – *every day human activities, such as using electricity or throwing away uneaten foods, adds heat-trapping gases to the atmosphere (cause) which causes the earth’s temperature to rise and is harming ecosystems and human life (effect).*

Disciplinary Core Ideas

In addition, this lesson aligns with the following Disciplinary Core Ideas:

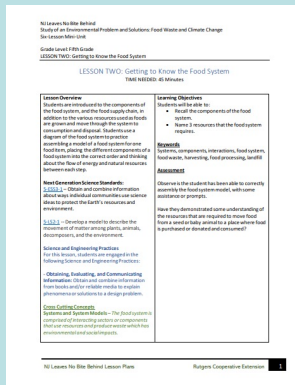
ESS2.A: Earth Materials and Systems

ESS3.C: Human Impacts on Earth Systems

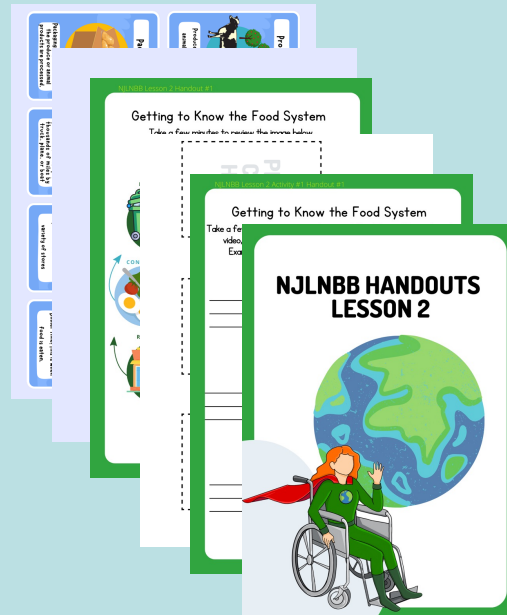
Getting to know the Food System FOR THE TEACHER



Instructors will be provided with the following...



Lesson Plan
Outline

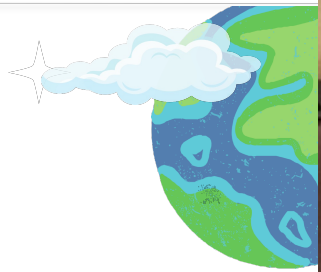


Complete Packet of
Student Handouts for
Lesson 2 to Review



Food system sector or component	Example
Ex: Processing	Crops are washed and stored
Ex: Retail Stage	A restaurant orders cases of hamburgers

Complete
PowerPoint Slides
with active links



Disposing
Landfill or compost

Consuming
Dinner time! This is when food is eaten.

Water
Water is a resource used throughout the food system.

Land
Land is a resource used to grow crops and raise animals.

Earthworms
Can be used to improve soil.

Production
Produce is grown and animals are raised.

Produce is harvested by hand and machine.

Workers
Farm workers plant, raise, and harvest foods.

Land
A resource used to grow crops and raise animals.

Food Processing
Produce is processed (washed, cut, cooked).

Machines
Machines are powered by fossil fuels or electricity.

Water
Water is a resource used throughout the food system.

Electricity
Powered by fossil fuels, power and is used to power lights, machines, and more.

Grocery Store Workers
Grocery store workers help us find and purchase food.

Retail Stage
Produce is sold in a variety of stores.

Packing Mater
Plastic, cardboard, wood crates, glass bottles.

Electricity
Powered by fossil fuels, power and is used to power lights, machines, and more.

Packaging
Packaging depends on how the produce or animal products are processed.

Water
Water is a resource used throughout the food system.

Fossil Fuels
Fossil fuels like gasoline, diesel fuel are used to power trucks, boats, and planes they can transport food.

Electricity
Powered by fossil fuels, power and is used to power lights, machines, and more.

Transporting
Food can travel up to thousands of miles by truck, plane, or boat.

Labeling
Produce is labelled with a sticker.

Factory Workers
Factory workers process foods and operate machines.

NAME: _____ DATE: _____

5th Grade Climate Change Hero Challenge!

Student Point Sheet

Welcome to your Climate Change Hero journey! Let's see who can reduce the most greenhouse gases and food waste during this program. As the program continues, you will learn about new ways to reduce your greenhouse gas impact and ways you can reduce food waste. Keep track of your Climate Change Hero Actions and points. You can find a list of Climate Change Hero Actions and how many points that action is worth below.

Good luck on your journey!

Climate Change Hero Action Description	Points
Looked up information on climatekids.nasa.gov	3
Ate oddly shaped or imperfect veggies/fruits	3
Brought home the food I did not finish at school lunch	3
Brought leftovers for my school lunch	3
Read fruit and vegetable stickers to eat foods that are closer to NJ	3
Made a plan to grow some of our own food at home	3
Turned off electronics and played with something that doesn't use electricity instead (drawing, reading, board games, outside time)	4
Tried a new food this week! What was the new food?	4
Ate leftovers for dinner (try it at least 1 time per week!)	4
Ate a fruit or vegetable that is grown in NJ/is in season	4
Add your own way to reduce greenhouse gas emissions:	5
Only took what I was hungry enough to eat (Check with parents first!)	5
Interviewed person in my house who goes to the grocery store about how to reduce food waste	5
Interviewed person in my house who cooks about how to reduce food waste	6
Watched YouTube videos about starting a compost pile at home with a grown up	6
Going to a farm, farmers' market, or community garden with a parent	6
Planted a tree	6
Found a farm, farmers' market, or community garden near my home and talked to a grown up about going to visit it to buy food	6
Talked to a friend or family member about what I am learning	7
Played the video game for this Unit	7
Started a compost at home	10

NAME: _____ DATE: _____

5th Grade Climate Change Hero Challenge!

Student Point Sheet

Welcome to your Climate Change Hero journey!

Keep track of your Climate Change Hero Actions and points. You can find a list of Climate Change Hero Actions and how many points that action is worth on the front of this worksheet.

Good luck on your journey!

Date	Description	Points	Signature
Total Points:		_____	out of 103 points



Welcome to the NJ Leaves No Bite Behind site! Here you can find all of the lessons, videos, games and resources for educators that have been developed for this project. The goal of the project is to **improve school administrations' and students' knowledge, attitudes, and behaviors towards adopting food waste reduction practices**. We hope you find these tools and lessons useful, engaging and fun! Please let us know if you have any [questions or feedback](#).

[For Kids](#)

[For Educators](#)

Evaluation type



Outcome evaluation measures program effects in the target population by assessing the progress in the outcomes or outcome objectives that the program is to achieve.



Impact evaluation assesses program effectiveness in achieving its *ultimate* goals.



Process evaluation determines whether program activities have been implemented as intended.

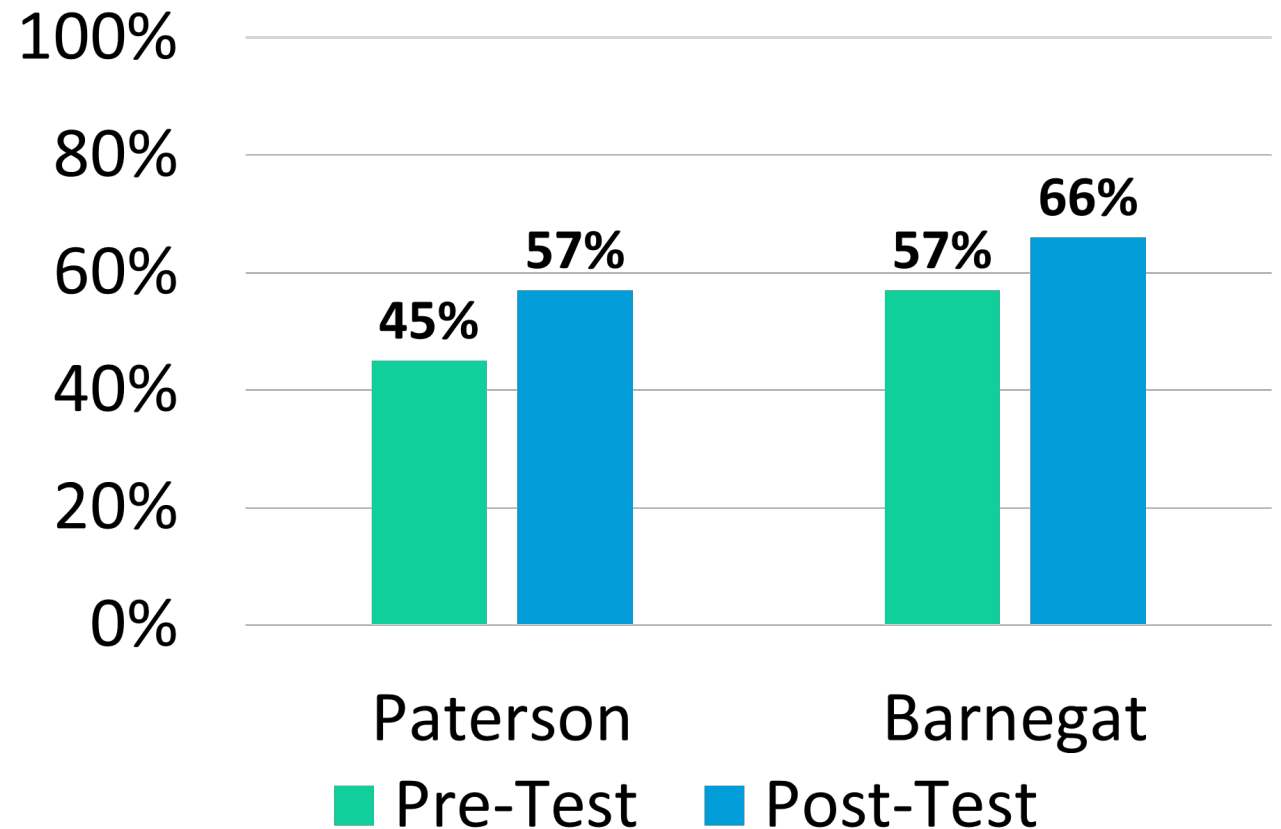
Student's Knowledge Assessment

Increase in the students' understanding of

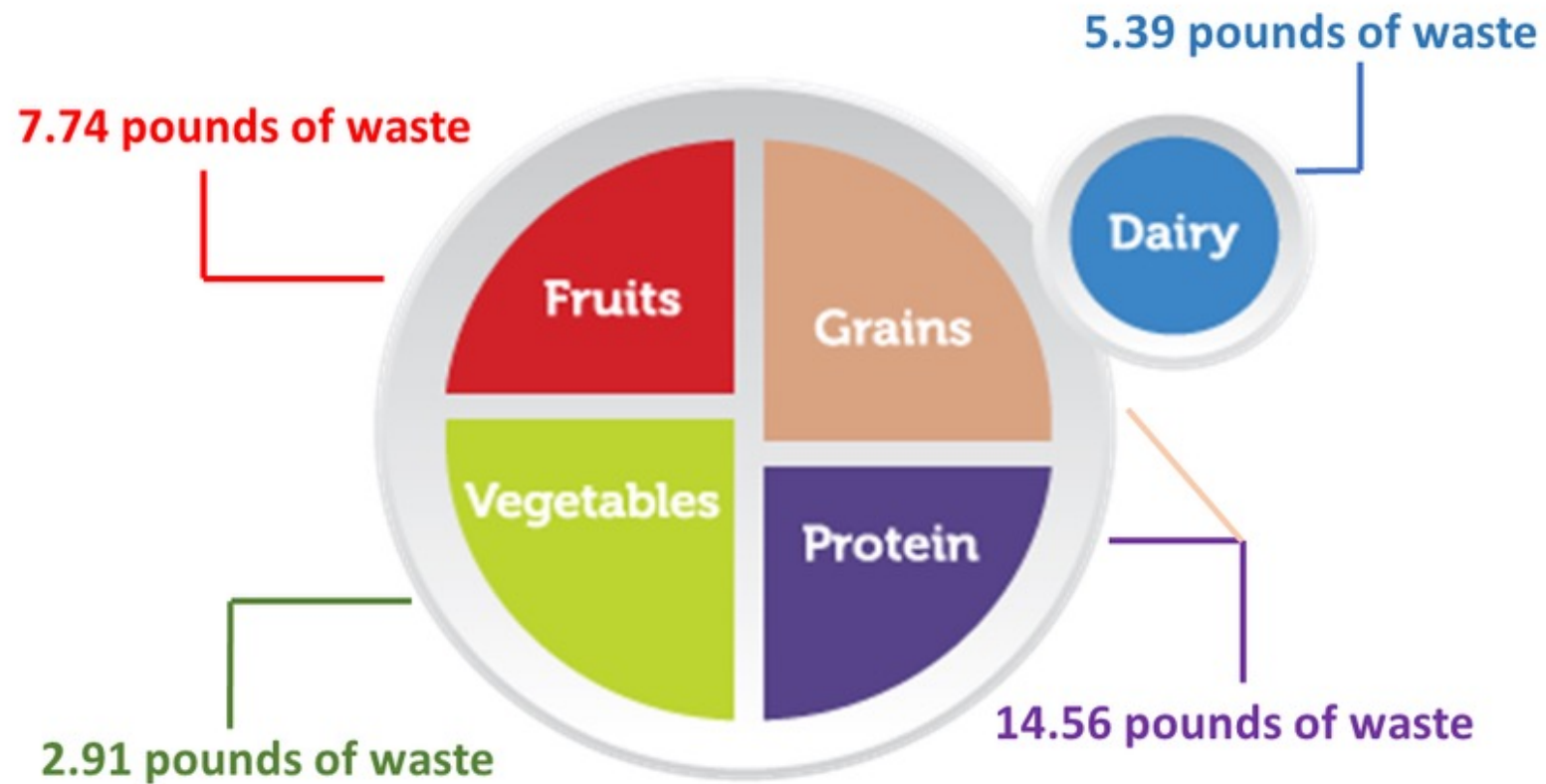
- *climate change,*
- *food system,*
- *food waste,*
- *food miles,*
- and *composting concepts*

across both study schools between the pre and post assessment.

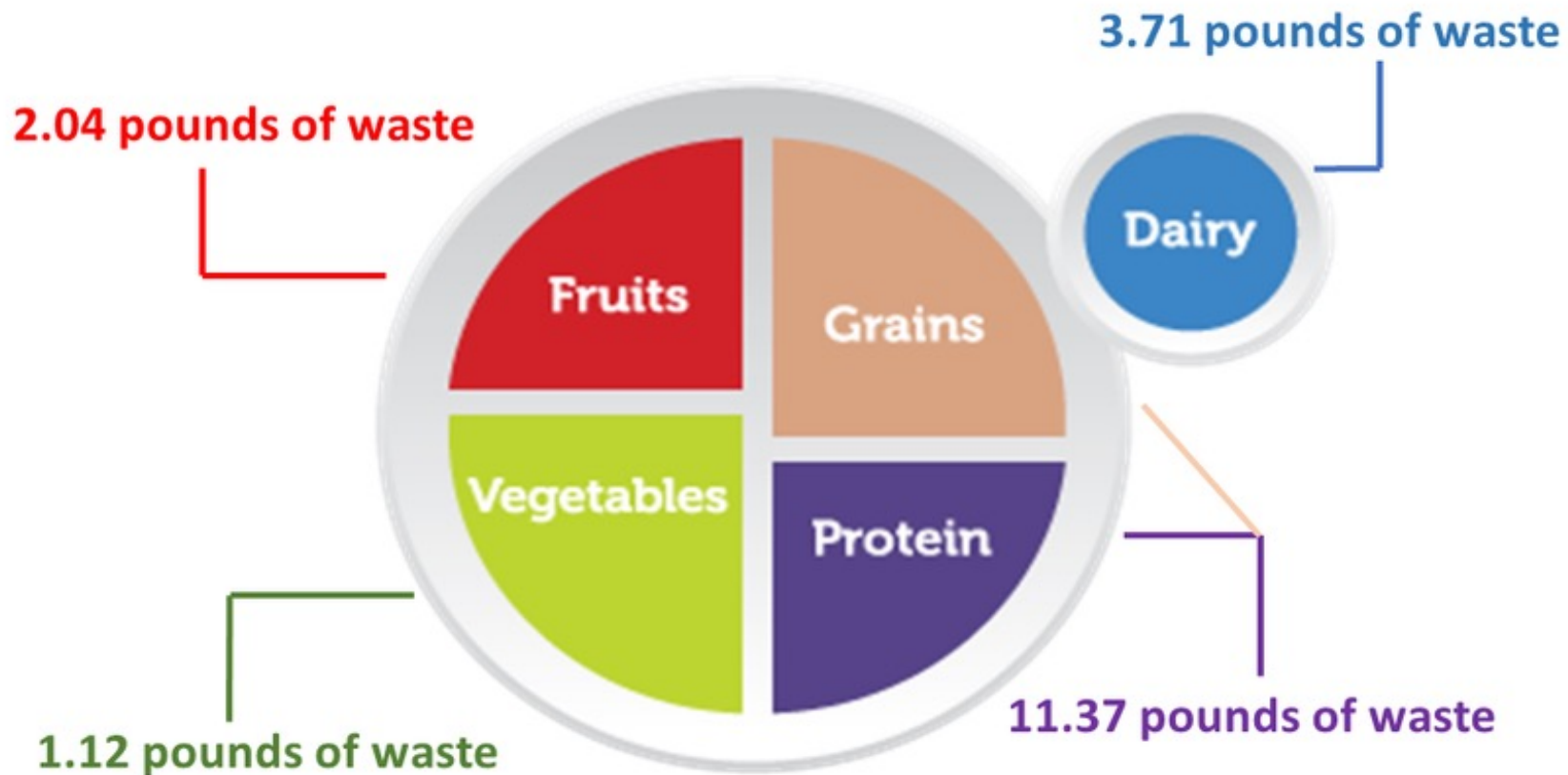
Knowledge Content



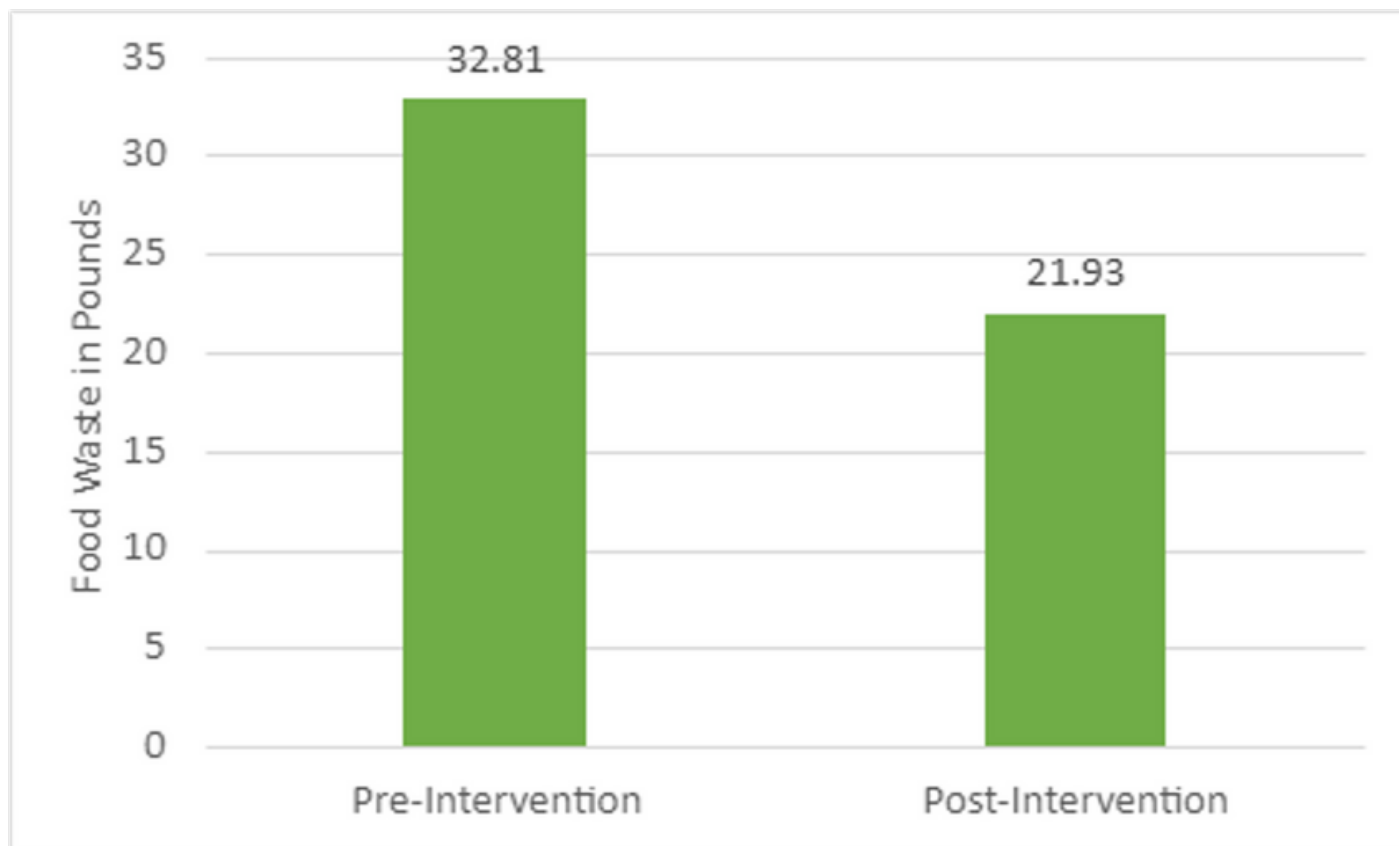
Pre-education Food Waste Audits for Barnegat



Post-education Food Waste Audits for Barnegat



Overall Food Waste Reduction



From January 2023 to March 2023, there was a **10.88 pound** decrease in food waste production amongst participating 5th grade students.

This would equal **652.80 pounds** of food saved over one school year amongst 5th graders alone.

What's to come?

- Comparing Intervention vs. Control Schools
 - Student's Knowledge, Attitudes and Behavior
 - Student's Food Waste Measures
- Pre and Post Intention for each School
 - Student's Knowledge, Attitudes and Behavior
 - Student's Food Waste Measures

Thank you for your time.

QUESTIONS?