Farmstand Business Curriculum

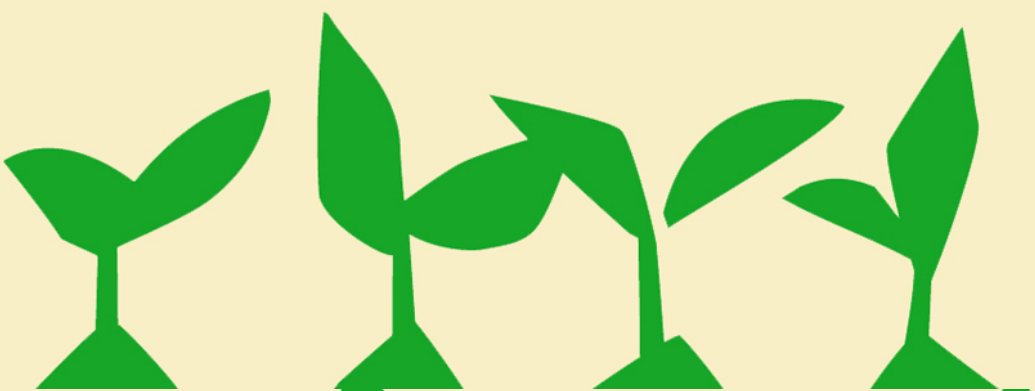
GROW NYC

Farmstand Business Curriculum
Unit 1: Getting to Know the Local Food System
Grades 9-12

Teaching students the basics of growing food, creating a business, and working as a team to serve their community with support from GrowNYC's existing youth engagement programs.

GROW NYC

Unit 1:
Getting to Know the Local Food System



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Note to Facilitator on How to Use this Curriculum

Welcome to Unit 1: Getting to Know the Local Food System, the first unit of GrowNYC's Farmstand Business Curriculum! We recommend you complete this Unit first, since it explores foundational concepts related to food, farming, and community development that set the stage for creating your real or hypothetical farmstand business. Follow the steps below before you begin facilitating this curriculum. You can also find this information in our Facilitator's Guide along with additional resources.

WHAT OPTION WILL YOU FACILITATE?

There are two options you can choose from to facilitate this curriculum:
Option 1: Set up a real food access point with the intent of growing and/or distributing produce
Option 2: Set up a hypothetical food access point with no plan to grow nor distribute produce

Note: A food access point is a place where consumers can purchase or get nutritious, high quality and affordable food. A food access point can be a supermarket, bodega, grocery store, market, farmstand, soup kitchen, and more.

Option 1 requires a dedicated facilitator with the goal of creating a real-life food access point. This project is a major undertaking and requires more oversight, resources, and time. Option 2 can be facilitated virtually or on school campuses that do not have access to growing space and or with schools who have no intent of growing or distributing food. This curriculum is primarily oriented towards Option 1 because it requires the most preparation, however, Option 2 can be taught with a similarly serious tone, understanding that students and facilitators are role-playing or pretending that they are building a real business. The skills gained by following Option 2 are still valuable and we recommend participating in this project no matter the option you have access to.

Note: If you've selected Option 1 and plan on growing and or distributing produce, we recommend glancing at Unit 2: Intro to Business and the School Farmstand Manual before you begin this curriculum. If you have any questions, please reach out to schoolgardens@grownyc.org.

DETERMINE YOUR STARTING POINT

Whether real or hypothetical, your student's food access business has the potential to be based on the garden, farm, or growing space on your school campus. If you don't have a garden or farm, don't worry, your students will begin to imagine what that could look like. Determine what stage best suits you and recognize that you might fall between some of these stages. As you move through Unit 1, these stages will become more relevant, so make sure you and your classroom community know where you are at before you begin.

Stage 1: No growing space or growing operations (no planting, producing, distributing)
Stage 2: Foundation or space for growing but not currently growing plants or food
Stage 3: Space that is active with some growing but not distributing food or producing enough for distribution
Stage 4: Space that is currently active and growing food with some form of distribution (i.e. donating, using for coursework, supplying to the cafeteria, etc.)

There is no right or wrong place to begin this curriculum. Each lesson in this curriculum has valuable learning outcomes for your students regardless of if you are growing food, plan on developing a food access business, or are simply looking to expand your knowledge of our food system.

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REVIEW THE LESSON STRUCTURE

Each lesson is divided into five parts: warm-up, part one, part two, wrap-up and reflection, and activity extensions. We recommend completing them in this order, however, they are also created as standalone activities and can be adjusted to meet the needs of your students.

Warm-up: The goal of the warm-up is to spark students' interest while allowing them to think about their connection to the topic of the lesson.
Part One: The first major section of each lesson introduces students to the key theme. It includes background information and a short activity that exposes students to key questions of the lesson.
Part Two: The second major section of the lesson allows students to apply what they learn from part one to the food access business for their school community (real or hypothetical).
Wrap-up & Reflection: Key questions for summarizing the lesson's topic to be used as a guide for discussion or independent reflection.
Activity Extensions: Activity extensions can be found directly in the lesson plan. If you are looking for more resources, videos, and learning materials to support each lesson, those can be found in the Facilitator's Guide.

Timestamps for each section are identified throughout the lesson plan, however, there is room for flexibility if you want to adjust the amount of time you give each section. Some of the lessons have activities that have different time options, and some activities have optional extensions. These are noted directly in the lessons.

Here are a few recommendations for approaching each lesson based on your time needs:

45 minute-period
Each lesson can be completed in 45 minutes. If some lessons feel tight for you, we've structured the curriculum so you can wrap up after part one and assign part two as a take-home assignment or complete another class period. If you're completing it this way, the discussion questions at the end of Part One may serve as a wrap-up and reflection. Additionally, you are always welcome to expand on activities that have different timed options or extensions.

90 minute-period
This will allow you to stretch each section of the lesson to meet the needs of your students. If this is the case, leave more room for reflection during the warm-up, spend more time on the discussion questions, and allow ample time for research and group work during the part one and part two activities. Some lessons have suggested extensions, which can be incorporated into your classroom period or offered as take-home assignments.

NOTES:

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Who is GrowNYC?

At GrowNYC, we protect the environment, create green spaces, help people stay healthy, and give them opportunities to make a positive impact. Our mission is to improve New York City's quality of life through environmental programs that transform communities block by block and empower all New Yorkers to secure a clean and healthy environment for future generations.

GrowNYC was originally created in 1970 as the Council on the Environment of New York City (CENYC). Born out of the spirit of the first Earth Day, CENYC was initially a policy-based organization, writing comprehensive reports about quality-of-life issues like air quality, traffic, and noise. Our city has changed a lot since then and so have we. As the largest and most established environmental organization in NYC, we are proud to have played a pivotal role in helping New York City transform over the past five decades. Today 3 million New Yorkers each year participate in our programs. We envision a New York in which every New Yorker can flourish. Every garden. Every school. Every street. Every neighborhood. Every borough. We work in 4 main areas: conservation, green spaces, education, food access and agriculture.

Food Access and Agriculture:
Our network of Greenmarket farmers markets, Farmstands, Fresh Food Box pick-ups and Wholesale ensures that all New Yorkers have access to the freshest, healthiest local food. We are bringing more green space to our city by building and rejuvenating community and school gardens.

GrowNYC Farmstands are part of a network of food access retail sites operated by GrowNYC, along with Greenmarkets and Fresh Food Box sites. Through Farmstands, GrowNYC trains and employs young people to sell fresh, affordable food in neighborhoods across NYC. The food sold at Farmstands is grown by farmers in the Northeast and transparently sourced through GrowNYC Wholesale. This vital food access program offers important job opportunities for young New Yorkers, ensures healthy, fresh food access across the city, and provides vital revenue for family farms in the Northeast. GrowNYC Farmstands were formerly known as Youthmarkets.

Education:
We foster future environmental stewards by providing 70,000 children each year with programs that provide meaningful interactions with the natural environment.

Conservation:
We are providing outreach and education to increase participation in the city's Zero Waste Programs and help conserve natural resources. We blanket the five boroughs with resources like textile and food scrap collection, Stop 'N' Swaps, and free training to make waste reduction easy for all.

Green Spaces:
We are transforming our regional food system and ensuring that all New Yorkers have access to the freshest, healthiest local food. We build and support community and school gardens through volunteer days, technical assistance, training, school garden grants and more.

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Lesson 1: Food Systems

OVERVIEW

In this lesson, students will learn about food systems at varying scales while beginning to explore their local food system. Students will be asked to identify key stages of the food system from a local food system to a global food system. Students will identify food stakeholders in their community and begin to map their local food system.

VOCABULARY

Food System, Stakeholder, Local Food System, Food Production, Processing, Distribution, Retail & Market, Consumption, Waste Recovery

MATERIALS

- Lesson 1: Food System Slides
- L1 Activity 1
- L1 Activity 2
- Writing materials

Note to Facilitator:
Part 2 of this lesson can be an extension or a take-home to allow more time for research and discussion during Part 1. If you need to wrap up after Part 1, use the discussion questions after Activity 1 for a wrap-up & reflection, or adjust to what feels right for you. Make sure students keep their work from this lesson, it will act as a prerequisite for the following lesson.

Grade Level: 9-12
Time: 45 mins

Key Questions

- What is a food system?
- What happens at each stage of the food system?
- What are the major differences between a local and global food system?
- What is a stakeholder?
- What does our local food system look like?

Students will…

- Think about how they interact with their food system daily.
- Understand what happens at each point in the food system and the role of stakeholders at each stage.
- Understand the differences between a global, regional, and local food system.
- Identify stakeholders within their local food system.

NYS Standards

Next Gen ELA/Literacy
11-12.RST.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

11-12SL1: Initiate and participate effectively in a range of collaborative discussions with diverse partners on complex topics, texts, and issues; express ideas clearly and persuasively, and build on those of others.

LESSON TASKS

Warm-up (5 min)

- Ask students to independently think about their favorite food or meal. Have them choose one of the ingredients from that meal and reflect on where it came from and how it might have arrived on their plate.
- Next, watch this short 2-minute video as a class.

Discussion Question:

- How many people, workers, or hands touched each ingredient in your favorite food, meal, or video?

Part 1: What is a Food System? (20 min)

Background (5 min):

- Using the Lesson 1: Food Systems slides, run through the background slides as a class, reading from the slide notes as you go.

Activity 1 (15 min):

See L1 Activity 1: Journey of our Food worksheet for activity instructions, materials, and time options.

Discussion Questions:

- Who were the different stakeholders? What role did they play in the food system?
- What deck showcased a local food system? Which showed a global food system? What were their major differences?

Part 2: Local Food System Mapping (15 min)

Students will use the food system map worksheet (L1 Activity 2) to identify stakeholders within each point of the food system for either their home or school community. If working in small groups they should focus on the different stakeholders surrounding their school community. If students are working independently, they can focus on their home community. Additionally, you can have students do two maps, one for their home and one for their school community.

Note: Students may not be familiar with the food system surrounding their school community. Consider making laptops available for light research or allowing for the use of personal devices. Additionally, this activity can be done outside on a walk around the school's neighborhood as a class group.

Activity 2 (15 min):

- Review the definition of a stakeholder.
- Fill out the food system map for your local school community, coming up with as many stakeholders for each point in the food system.
- Record any questions you have that you can research or answer later as a class.
- Share out, and if time allows, create one large food system map as a class for your local school community.

Wrap-up & Reflection (5 min)

- What point in the food system is the hardest to place with stakeholders? Why might that be? What is the easiest?
- Is most of your food coming from local places? Regionally? Globally? If you don't know, how might you find out?
- What is one point in the food system that you think could be reformed or changed? What would you do differently? Why?

L1 Activity 1: Journey of our Food

Overview
In this game, learners identify the different stages of the food system by reading various stakeholder stories. These stories are made up; however, they illustrate many realities that people working within our food system face daily and are based on real facts and scenarios.

Each food system deck has six cards representing the six stages of the food system (Production, Processing, Distribution, Market and Retail, Consumption, and Waste Recovery). Each deck has two sets, one with images depicting each stage and another with stakeholder stories. There are two decks for this game, one tells the story of a local food system and the other a global food system.

The purpose of this game isn't to identify what food system is better, but to understand the differences between two very different scales and how those differences might impact stakeholders at each stage, the environment, and our food access. The game offers two examples of an extremely multi-faceted food system and showcases experiences of those on opposite ends of our complex food system spectrum. If any of your students have their own personal stories to share about their or a family members' engagement with the food system, use your reflection time to share some of their stories.

Materials
- Local Food System Deck
  - Visual Set
  - Story Set
- Global Food System Deck
  - Visual Set
  - Story Set

Game Guide
This activity can be conducted in a couple of different ways depending on how much time you have. See below for varied time options and activity tasks:

Simple Version (10-20 min): In this version of the game, groups are given a set of cards from one of the decks to work with (local food system picture set, local food system story set, global food system picture set, or global food system story set). The facilitator can decide what sets (or decks) students are given and can add accordingly depending on time. Story sets will take longer than visual sets.

Instructions:
- Divide the class into groups of 6 students or less.
- Hand each group 1 set of cards from either deck (local food system or global food system)
- Give groups 5 minutes to try and figure out the correct food system order for their set, lining up from production to waste recovery. (For added fun, the facilitator can make this a competition and time groups)
- Once each group is lined up, groups should share their line-up positions and the facilitator can reveal the correct order.

Original Version (15 min): In this version of the game, groups are given each deck to work with separately (local food system deck or global food system deck). The facilitator can eliminate the visual sets if they want to challenge their learners. Alternatively, they can remove the story deck if their audience is more visual.

Instructions:

- Divide the class into groups of 6 students or less.
- Give each group one deck to work with.
- Instruct groups to read each card and match it with the correct visual card in order of the food system, or, if doing without visuals, line up using the story cards.
- Have groups share their findings and reveal the correct order.
- Repeat for the second deck.

Complex Version (15-30 min): In this version of the game, students will have all the cards (picture and story) for both decks (local food system and global food system). The goal is to match all the visual cards with their respective story cards within a certain amount of time.

Instructions:

- Divide into small groups of anywhere between 2-4 students.
- Hand each group all the cards from both decks (local food system visual set, local food system story set, global food system picture set, or global food system story set). Make sure the cards are not visible and instruct groups to keep everything face down.
- Have groups lay their cards face down on a surface or table (there should be 24 cards total!)
- The facilitator should instruct the class that they will be leading groups through the game. Every 30 seconds or so, the facilitator will call "flip!" and at that moment (and that moment only) should groups flip three of the cards. Once students flip the cards, they will have 1 minute to read the stories or identify what the image is showing. (The facilitator can adjust the timing to accommodate what works well for their learners)
- As more cards flip, groups should begin attempting to place them for their correct food system, matching the visual cards with the stakeholder stories, from production to waste recovery.
- Once complete the facilitator can go around and check group work or have groups share their findings.

Note: This version of the game can be shortened and done without calling "flip" and letting groups turn all their cards at the same time. If doing it this way, you can set a time limit for groups to identify all their cards and place them in their respective decks.

Answers

<u>Local Food System Deck</u>

Visual Set (from top left to right): apple orchard (production), apple picker (processing), produce truck (distribution), GrowNYC market (retail & market), apple pie (consumption), food scrap pile (waste recovery)
Story Set (from top left to right): Emily (production), John (processing), Elizabeth (distribution), Andréas (retail & market), Sonya (consumption), Eli (waste recovery)

<u>Global Food System Deck</u>

Visual Set (from top left to right): banana plantation (production), banana harvester (processing), cargo ship (distribution), bodega (retail & market), bananas (consumption), trash can (waste recovery)
Story Set (from top left to right): Helga (production), Jessica (processing), Santiago (distribution), Alex (retail & market), Maris (consumption), Corey (waste recovery)

Local Food Deck: Visual Set

Local Food Deck: Story Set

Emily I run a small-scale farm called Apple Blossom in Albany, NY with my family. We grow 10 varieties of apple trees all of which are local to New York State. Each season, I hire a group of farmhands to care for the trees. They water and prune them to keep them healthy and strong. On the farm we also care for the soil, and grow a variety of native plant species that enhance the biodiversity of the apple orchard by attracting lots of bees and beneficial insects.	**John** I work at Emily's Apple Orchard as a farmhand. My main responsibility is to harvest the apples and package them to be sold to markets in New York City and near our farm. I usually work long hours at the end of Summer and Fall, sometimes harvesting for 9 hours a day. Every apple is handpicked, sorted, and then bagged by variety. Some apples that are bruised and can't be sold to markets we use to make apple cider. Sometimes I work in our cider facility to process and package apple cider.
Elizabeth I am a farmhand at Emily's apple orchard. In addition to working in the fields, I also transport the apples and apple products to our markets in New York City. We have a couple of trucks equipped with special cold storage refrigeration to keep the apples fresh during the drive. My longest trip is to New York City to sell apples at farmer's markets. I also drive the truck to restaurants and markets near Emily's farm in Albany, NY.	**Andréas** I work at the Jackson Heights Greenmarket in New York City which is operated by GrowNYC. There are many different farms that sell their produce at this market. I work with the Apple Blossom Farmstand to sell apples, apple cider, and other products to customers. Fall is especially busy since that is peak apple season. Some varieties cost more than others because they are harder to grow. Most of our varieties cost $2.50 per lb.
Sonya I bought some apples at the Apple Blossom Farmstand at the Jackson Heights Greenmarket. I usually buy a big bag of apples in the Fall to make apple pie. I like to buy a variety of apples to add a lot of flavor to my pie. When I bring them home, I slice the apples thin and layer them in a pie crust to bake. I also eat some apples whole, and like to freeze slices for baking pies later in the season. Apples are one of the many things I like to buy at the Greenmarket.	**Eli** I work for a compost organization here in New York City. Composting is a process where organic waste like food scraps (vegetable peels, egg shells, fruit scraps) is turned into nutrient-rich fertilizer for the soil. I help collect food scraps in the neighborhood of Jackson Heights. Once collected, we direct it to small-scale compost production sites to be turned into compost that is delivered back into communities for their gardens and backyards. I see a lot of apple cores in our compost piles in the Fall!

Global Food Deck: Visual Set

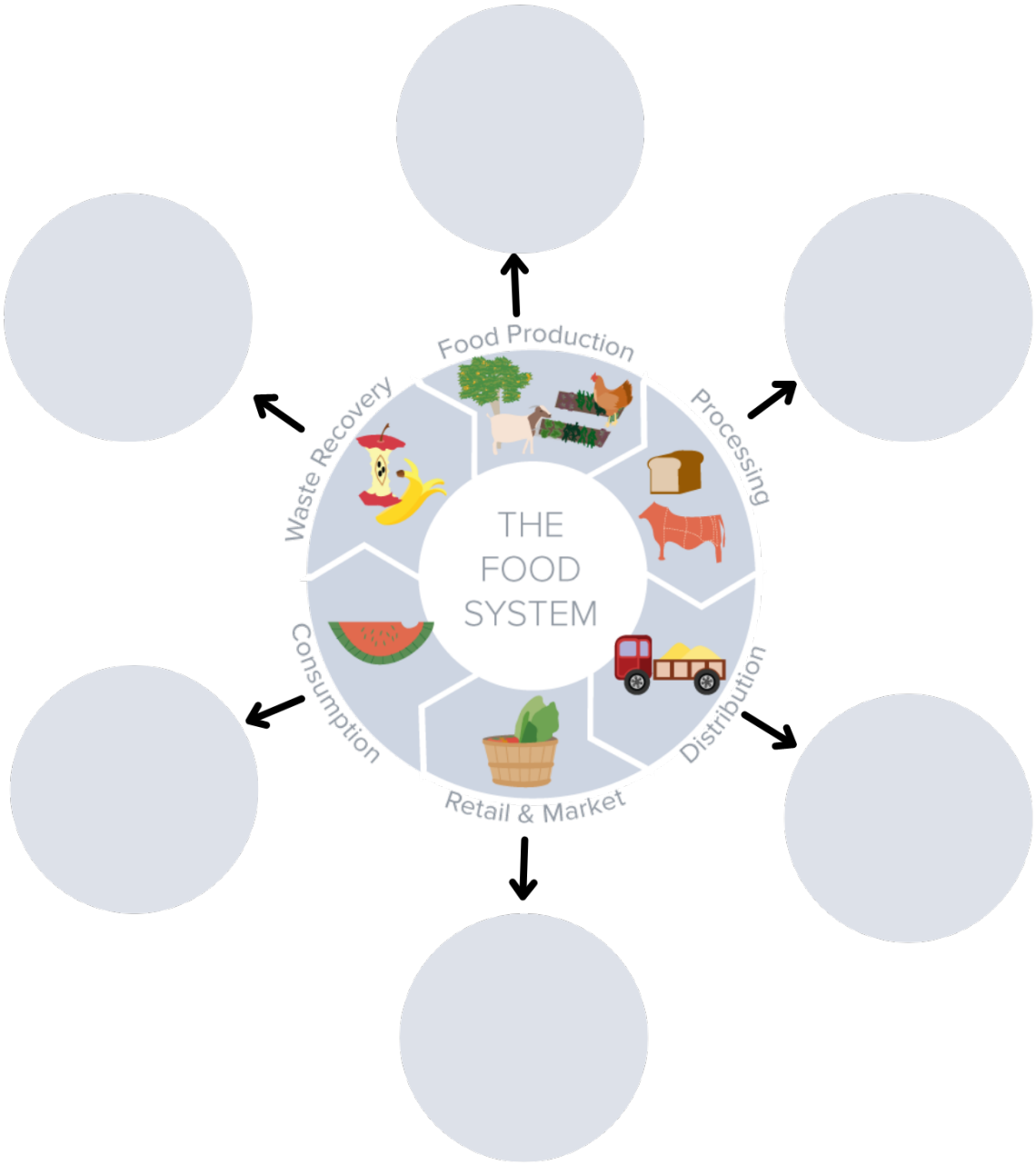
Global Food Deck: Story Set

Helga I oversee all of the banana plantations in Ecuador, South America. I work for Dole, one of the largest fruit production companies in the world. I live in Switzerland, but I make sure that our plantations in Ecuador are growing as many trees as possible because we produce bananas all over the world. Although I have never seen the plantations, I hire people to build new plantations and I hire private contractors and scientists to conduct product checks at each of our plantations.	**Jessica** I work at the San Migual Dole Farm in Ecuador, South America. I am only 14 years old, but I work every day to help support my family. We all work for Dole to harvest bananas. There are almost 300 people who work on this farm, which is so big it's almost the size of 700 soccer fields. Sometimes I work 12-hour long days without taking any breaks. The conditions are hard, and oftentimes I get hurt using tools to pick bananas.
Santiago I work for a shipping company that ships food products worldwide by boat. One of the products I work to ship is bananas. I work on a boat that travels from Ecuador through the Panama Canal, one of the largest ports that allows for the transfer of products from South America to North America. The bananas are stored in very large crates, and there are usually 4 million of them on board for one trip. The bananas travel about 3,000 miles to the shore of Wilmington, Delaware. There, trucks take them to where they need to go.	**Alex** I work at a bodega in Mott Haven, Bronx. I have been operating this bodega for 20 years, and it is an important part of the community here in Mott Haven. We sell many things at the bodega including sandwiches, soft drinks, baked goods, household items, cat and dog food, and select fresh produce. I get a shipment of bananas every week because they are one of the fruits we sell every day. I sell the bananas for $0.50 each.
Maris I live in Mott Haven, Bronx and every morning on my way to work I stop by my local bodega. I love my local bodega because it is such an important piece of my Puerto Rican community here in Mott Haven. I always order bacon egg and cheese, a coffee, and a banana to go. I try to eat a piece of fruit every day for its nutritional value, and I know the bodega will usually have something I can grab quickly like a banana, orange, or apple.	**Corey** I am a sanitation worker that works routes in the South Bronx. I work really long hours, and my day usually begins around 4:30am. We drive the truck around the South Bronx collecting municipal waste. We then drive to the waste transfer station in Mott Haven, where all of the waste from across the city. About 3,000 trucks pass through the South Bronx every day delivering over 12,000 tons of waste.

Name: _____ Date: _____

Food System Exploration

Instructions
In these circles, make a list of stakeholders at each point of the local food system within your home or school community.



Lesson 2: Food Access

OBJECTIVE

In this lesson, students will learn about their classroom communities' diverse perspectives and relationships to food. Students will identify the root causes of food insecurity, learn about food access points, and explore ways to fill food access gaps within their local school community.

VOCABULARY

Food Access, Food Security, Food Access Point

MATERIALS

- Lesson 2: Food Access Slides
- L2 Activity 2
- Writing materials
- Healthy snack (*optional*)

Note to Facilitator:
Trauma may be unearthed during this lesson. This lesson begins with a community agreement and asks that you acknowledge to the class that the topics in this lesson will touch on personal experiences and should be approached with care and respect. Please read through Activity 1 prior to completing this lesson with your class. After completing Part 1, we recommend offering a healthy snack to help students decompress.

Part 2 of this lesson can be an extension or a take-home to allow more time for research and discussion during Part 1. If you need to wrap up after Part 1, use the discussion questions after Activity 1 for a wrap-up & reflection, or adjust to what feels right for you.

Grade Level: 9-12
Time: 45 mins

Key Questions

- What is food access? What is food security?
- How do food distribution and access vary across our classroom community and NYC?
- What is a food access point?
- What ideas do we have for addressing food access in our community?

Students will…

- Understand how food access varies across their classroom community.
- Learn about the root causes of food insecurity and different food access points in NYC.
- Identify present barriers to food access within their local food system, and brainstorm ideas for filling it.

NYS Standards

Next Gen ELA/Literacy
11-12SL1: Initiate and participate effectively in a range of collaborative discussions with diverse partners on complex topics, texts, and issues; express ideas clearly and persuasively, and build on those of others.

11-12SL1b: Work with peers to set norms for collegial discussions and decision-making, and establish clear goals, deadlines, and individual roles as needed.

11-12SL1d: Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.

Social-Emotional
1A. Identify and understand their emotions and how emotions relate to their actions. Use understanding of emotions to inform actions.

2A. Recognize and build empathy for the feelings and perspectives of others.

LESSON TASKS

Warm-up (5 min)

- Read out the community agreement and ask students if there are any they want to add. Make this agreement available when you move on to Activity 1

Part 1: What is Food Access? (20 min)

Background (5 min):

- Using the Lesson 2: Food Access slides, run through the background slides as a class, reading from the slide notes as you go.

Activity 1 (15 min):

Students will partake in this movement-based activity that introduces them to common misconceptions around food accessibility and asks them to critically consider and respect each other's perspectives about food and food access. It is important to acknowledge that this activity may unearth some very personal feelings and experiences. It is recommended that you review your community agreements before beginning this activity. If you feel like your classroom community is not ready to have these discussions you can turn to the food access lesson of our food justice curriculum to begin conversations.

This activity is divided into general statements and personal statements. Personal statements ask that students share deeply personal feelings about their food and economic situations.
If opting for a more private version of this activity, use the seated version, in which students can rest their heads and raise their hands privately in response to the statements. If people would like to share, they can do so, but if not, their privacy is respected.

Instructions for each version are below:

Option 1: Movement Version

- Place three pieces of paper that say “strongly agree, strongly disagree, neutral” in three different areas of the classroom (make sure they are spaced as evenly as possible. The goal is to create a scale)
- Have students begin at the neutral
- Read a statement, and have students move to where they agree, disagree, or remain neutral with the statements.
- Emphasize there are no wrong answers, only personal opinions! Refresh using the community agreement if necessary.
- After students move, they have the option to turn to someone in their zone and discuss why they chose that response or share some responses as a classroom group. You can also do this activity without sharing if that works better for your group.

Option 2: Seated Version

- Students should remain seated with their heads resting on a surface.
- Read each statement, allowing students to raise a thumbs up for strongly agreeing, a thumbs middle for neutral, and a thumbs down for strongly disagreeing.
- After reading each statement, the facilitator can pause to see if anyone would like to share.

General Food Statements:

Note: This is the recommended order, but statements can be read in whatever order feels right for your group. Responses to these statements are one's personal opinions which are shaped by what we learn, how we grow up, what we have access too, and more. There is no right or wrong feeling about these statements.

- There is enough food in this country to feed everyone
- There is enough land on our planet to grow food for everyone
- All food should be free of charge
- People are food insecure because food is expensive
- If people made the right food choices, they would be less food insecure
- Hunger limits people's ability to learn and be productive.
- The presence of hunger and poverty in this country is evidence that there is something wrong with our national priorities

Personal Food Statements:

Note: This is the recommended order, but statements can be read in whatever order feels right for your group. Remind students that these are "I" statements, and responses will reflect each person's personal and unique experience.

- I can find fresh fruits and vegetables near my home
- I have access to culturally relevant foods in my community (ask students what they think culturally relevant means)
- It is difficult to get affordable nutritious food where I live
- I or someone in my family has to travel a far distance to get good and nutritious food
- There is a lot of hunger in the community where I live
- I or someone I know, often feel hungry

A short discussion or silent reflection is recommended before moving into Part 2. We recommend introducing a healthy snack while students take time to reflect and or watch the video below.

Discussion or Reflection Questions:

- Watch What is Food Insecurity?, lead a community discussion or have students silently journal about the lesson ideas and or conversations.

Part 2: Feeding the Gap (15 min)

Last lesson you talked about the food system, the various stages, and the role of stakeholders at each stage. Today, students will take on the role of stakeholders in your community. Using a key goal of NYC's Food Policy 10-year plan, a real document of the NYC Mayor's Office, students will consider how a food access point might support your school's local food system. As a class, you will come together and consider the implications for your school food access needs.

Activity 2 (15 min):

- Refresh yourself with the community food system map you drew from L1 Activity 2.
- Review as a class the different stages of the food system map.
- In groups, or independently, complete the L2 Activity Worksheet.
- As a class, share your ideas for food access points, the facilitator should make note of everyone's ideas. (These will be used in future lessons)

Discussion Questions:

- Are there other stages of the food system that need reforming to assist with your food access point idea? If yes, what stage(s) and how might you reform them?

Wrap-up & Reflection (5 min)

- Come up with a collective goal or statement of purpose on how your farm business will address food access in your school community. This can mirror the NYC food policy's goal setting and can be as simple as a list or a couple of sentences.

Note: This collective goal or statement of purpose will be used in Lesson 3: Introduction to Urban Farming.

L2 Activity 2: Feeding the Gap

Introduction
NYC's Food Forward policy plan is the first-ever 10-year food policy initiative in NYC. As a community stakeholder and concerned citizen, your task is to propose a plan for your community on how the food policy plan might address one of its central issues, food access in NYC.

Here is more information about NYC's Food Forward Policy initiative before you get started:

"First issued in February 2021, this plan outlines a comprehensive policy framework to reach a more equitable, sustainable, and healthy food system by 2031.

Nearly 1.2 million New Yorkers were food insecure as of early 2020, according to estimates by Feeding America. As a result of COVID-19, that number swelled to 1.6 million food-insecure New Yorkers, including school children, seniors, parents, and working adults.

This plan is organized around 5 goals and 14 strategies that confront today's challenges and seize opportunities to improve the food system:

Goal 1: All New Yorkers have multiple ways to access healthy, affordable, and culturally appropriate food. The city faces an unprecedented food insecurity crisis, affecting nearly one in five New Yorkers, that requires a focus beyond traditional emergency food systems.

NYC will:
A. Expand food benefits to reach more New Yorkers in more places.
B. Distribute food more equitably.
C. Reconfigure how the City sources food"

Using your understanding of food access, and NYC's Food Forward Policy framework, your task is to come up with a plan for addressing food access in your home or school community.

Step 1: What is your understanding of food access?

Food Access is…

_____

_____

Step 2: What are some current barriers to food access in your community? (Your home or school community)

1. _____
2. _____
3. _____

Step 3: How could a food access initiative help to address food insecurity in your community? Circle one idea from above and come up with an idea of how a food access point could help address this issue:

_____

_____

_____

_____

Lesson 3: Introduction to Urban Farming

OVERVIEW

In this lesson, students will identify the major differences between industrial and small-scale agriculture and explore different types of urban farming in NYC. Students will brainstorm methods of urban farming that will expand on their food access goals for their school community.

VOCABULARY

Industrial Agriculture, Small-scale Agriculture, Urban Agriculture, Rooftop Farming, Aquaponics, Community Garden, Hydroponics

MATERIALS

- Lesson 3: Urban Farming Slides
- Computers, tablets, or personal devices
- L3 Activity 1: Urban Farm Research
- L3 Activity 2: Urban Farm Design Lab
- Hidden Costs of Industrial Agriculture | Union of Concerned Scientists (printed copies)

Note to Facilitator

At this point in the curriculum, you will need to know if you are facilitating Option 1 (creating a real food access business) or Option 2 (creating a hypothetical food access business). This lesson begins to take shape around the land, garden, or food access project on your school campus. For the rest of the activities in this curriculum, students will be designing and implementing plans related to the food access business they will eventually create as a culmination of their work through this curriculum. Please explain this to students before beginning.

This lesson offers an extension after Part 2 that can be completed in a longer class period or as a take-home assignment.

Grade Level: 9-12
Time: 45 mins

Key Questions

- What is the difference between industrial and small-scale agriculture? What are the benefits? Challenges?
- What is urban agriculture?
- What are some examples of different types of farming in urban settings?
- What method of food production do we think will support our local community?

Students will…

- Understand the basic differences between industrial agriculture and small-scale agriculture.
- Understand the importance of urban agriculture in urban settings by learning about different urban farms in NYC.
- Identify what food production techniques and guiding principles would support students' local community and food access needs.

NYS Standards

New York State P-12 Science Learning Standards
HS-ESS3-2. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios

HS-LS2-7: Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity

Next Gen ELA/Literacy
11-12.RST.2 Determine the key ideas or conclusions of a source; summarize complex concepts, processes, or information presented in a source by paraphrasing in precise and accurate terms.

11-12SL1: Initiate and participate effectively in a range of collaborative discussions with diverse partners on complex topics, texts, and issues; express ideas clearly and persuasively, and build on those of others.

Social Studies
11.5 a New technologies and economic models created rapid industrial growth and transformed the United States.

LESSON TASKS

Warm-up (5 min)

- As students read or watch, have them make one note or highlight one point that they find shocking or interesting. If time permits, have a few share with the class.

Option 1: Have students read this short article: Hidden Costs of Industrial Agriculture | Union of Concerned Scientists.

Option 2: Watch the video on the slideshow as a class.

Part 1: What is Urban Agriculture? (15 min)

Background (5 min):

- Using the Lesson 3: Introduction to Urban Farming slides, run through the background slides as a class, reading from the slide notes as you go.

Activity 1 (10 min):

This is a light research activity where groups will look at a specific type of urban farming using examples from across NYC. Even if you are operating a specific type of farming at your school, use these case studies to explore new ways that you might expand on or better your existing space(s). For some classrooms, this will be a starting point. Keep students' notes from this activity as these farming methods will be introduced again in Lesson 8.

- Break up into small groups and hand out the L3 Activity 1 to each student. Make sure each group has a laptop or tablet for accessing the internet.
- Assign groups one or more of the urban farms to research.
    - Group 1: Oko Farms
    - Group 2: Brooklyn Grange
    - Group 3: Hattie Cathan Herban Farm
    - Group 4: GrowNYC Teaching Garden
    - Group 5: Teens for Food Justice
- Have students in groups answer the questions on the worksheet by going to their farm's website and learning more about them.
- Share findings as a class if time permits.

Discussion Questions:

- What are the benefits beyond food that an urban farm might provide? Consider the environment, communities, and the broader mission of food access.

Part 2: Urban Farm Design Lab (20 min)

Last lesson, students identified various food access points that might benefit their local communities. Now have students imagine - if you were to fill a gap in the production stage of your community's food system, what role would you play; what would that look like? If time and space permits, groups can do their work outside! Groups are also welcome to walk around the school to gather ideas and are encouraged to use computers for research.

If you are in stage 3 or 4 of your farmstand business, you can use your current growing space as your starting point for this activity.

Note: If you didn't have time to discuss or reflect on this L2 question, begin here and then complete the activity.

- Create a collective goal or statement of purpose for how your farm business will address food access in your school community. This can mirror the NYC food policy's goal setting.

Activity 2 (20 min):

- Divide the class into small groups of 3-5 students.
- Reflect on your work from previous lessons including your food system map, and food access goals for your school community.
- Run through the L3 Activity 2 worksheet instructions before students begin working on their plan.
- Leave enough time for groups to share.

Take note of students' ideas, especially those that overlap between groups. These may be great avenues for your classroom's farm business project.

Wrap-up & Reflection (5 min)

- What method(s) of food production seems possible for our school community? Why?
- What do you envision for a food access point that supports this urban production plan?

ACTIVITY EXTENSION

L3 Activity 2 Extension

- Redraw your food system map to match your new plan for food production and assess how all the other stages will be impacted if you adjust the production stage. Have students highlight the sections of the food system map that they would impact directly.

Note: This extension can also be found on the L3 Activity 2 lesson page

L3 Activity 1: Urban Farm Research

AQUAPONIC FARMING & OKO FARMS

What is Aquaponic Farming?

Aquaponic farming is a food production system that combines aquaculture (the production of aquatic animals like fish) and hydroponics (the production of plants without soil). Aquaponic farming acts as a natural ecosystem where the decomposing waste of aquatic animals provides rich nutrients to the growing plants. Farming this way also saves a lot of water because it gets recycled back into the same system. Aquaponics has been done for thousands of years across many cultures and countries. It is an ancient technique that proves to be very resilient and affective in urban settings.

Figure 1: Aquaponic Farm

Step 1: Visit your organization's website to learn more about how they farm.

Website: https://www.okofarms.org/

Step 2: Answer the questions below:

Describe the type of production method(s) this farm use for growing food?

_____

_____

Do they have any food access initiatives or food access points? If so, briefly describe.

_____

_____

ROOFTOP FARMING & BROOKLYN GRANGE

What is Rooftop Farming?
Rooftop farms are a type of urban agriculture where food is produced on top of buildings. Rooftop farming can be done by creating green roofs, growing in containers, using hydroponic systems, or growing in soil-based beds. Rooftop farming has become popular in urban settings because it offers a smart use of space and provides additional benefits such as reducing the energy needed to heat or cool buildings, providing space for wildlife, and helping address food insecurity. Some rooftop farms offer a wide variety of educational programming and partake in beekeeping.

Figure 2: Brooklyn Grange Rooftop Farm

Step 1: Visit your organization's website to learn more about how they farm.

Website: https://www.brooklyngrangefarm.com/

Step 2: Answer the questions below:

Describe the type of production method(s) this farm use for growing food?

_____

_____

Do they have any food access initiatives or food access points? If so, briefly describe.

_____

_____

COMMUNITY GARDENS & HATTIE CARTHAN HERBAN FARM

What is a Community Garden?
Community gardens are where the residents of a community are empowered to design, build, and maintain spaces in their communities. They are spaces where residents can decide what is grown and collectively care for the space. Members of a community garden can get plots for growing, and often share with other people from the community. A community garden can be urban, suburban, or rural. It can grow flowers, vegetables, or a community. It can be one community plot or many individual plots. You'll often see food growing in raised beds or containers, spaces for people to relax, and sometimes, livestock such as chickens.

Figure 3: 400 Montauk Ave. Community Garden

Step 1: Visit your organization's website to learn more about how they farm.

Website: https://www.hattiecarthancommunitymarket.com/

Step 2: Answer the questions below:

Describe the type of production method(s) this farm use for growing food?

_____

_____

Do they have any food access initiatives or food access points? If so, briefly describe.

_____

_____

TRADITIONAL URBAN FARM & GROWNYC TEACHING GARDEN

What is Traditional Farming?
Traditional farming is practiced all over the world and uses a variety of techniques. Traditional farming often takes place outside with the use of soil-based ecosystems. This method of farming incorporates practices such as crop rotation, natural pest control, companion planting, and hoop houses. Each season farmers amend the soil by adding compost and various nutrients considering the natural environment and seasonal cycles. Traditional farms might also have raised beds and containers for expanding growing space, especially in urban settings. Traditional farms can also look like large industrial farms, so it's important to note that this type of farming isn't exclusive to urban areas.

Figure 4: Teaching Garden at Governor's Island

Step 1: Visit your organization's website to learn more about how they farm.

Website: https://www.grownyc.org/gardens/manhattan/governors-island-teaching-garden

Step 2: Answer the questions below:

Describe the type of production method(s) this farm use for growing food?

_____

_____

Do they have any food access initiatives or food access points? If so, briefly describe.

_____

_____

HYDROPONIC FARMING & TEENS FOR FOOD JUSTICE

What is Hydroponic Farming?
Hydroponic farming is a farming technique that doesn't use any soil. Instead, plants are grown in a water-based nutrient solution. Plants or seeds are placed in a growing medium such as coconut coir, vermiculite, or perlite, which is placed over water which is given a specific amount of nutrients that the plants need to grow. Lots of different types of plants can be grown hydroponically, including leafy greens like herbs, lettuce, spinach, and kale, and fruits like cucumbers and tomatoes. Hydroponic farming is great for small indoor spaces since plants can stack on top of each other in growing systems. Hydroponic farming uses a lot of electricity, and the start-up costs can be high.

Figure 5: TFFJ MLK Jr. Educational Campus

Step 1: Visit your organization's website to learn more about how they farm.

Website: https://teensforfoodjustice.org/

Step 2: Answer the questions below:

Describe the type of production method(s) this farm use for growing food?

_____

_____

Do they have any food access initiatives or food access points?

_____

_____

L3 Activity 2: Urban Farm Design Lab

Introduction
The city has read your ideas for how NYC's Food Forward Policy plan can address food access in your community. One of the ideas most mentioned in your comments was to provide more options for growing and producing food directly in communities through urban farming and agriculture opportunities.

Now, the city would like to devise a plan that takes food access and farming into consideration. Your class has been tasked with piloting this project and are asked to design an urban farm plan for your school community that could feed your school and the surrounding area.

NYC has provided a set of guidelines for completing this project and asks that you follow them closely when devising your urban farm plan.

Project Guidelines:

- Each group is given 1 plot of vacant land about the size of your classroom to work with
- You have unlimited funding with no strings attached.
- You can collaborate across groups if both groups agree to share ideas.
- Your community is a resource, so consider how you will use it (family members, organizations, student body, etc.)

Step 1: Before you begin, what is the collective goal or statement of purpose your class came up with on how your farm business will address food access in your school community:

_____

_____

_____

Step 2: Answer the following questions as a group:

Where will you locate your farm? (indoor, outdoor)

_____

What will you name your farm?

_____

What communities will you serve?

_____

How will you grow your food? What food will you grow?

_____

Does your farm offer anything other than food or produce?

_____

Does your farm have a food access point? Briefly describe.

_____

Step 3: Draw or describe your vision for your urban farm:

_____

_____

_____

Activity Extension
Redraw your food system map to match your new plan for food production and highlight the sections of your local food system that they would impact directly by making this change.

Lesson 4: Land Usage

OVERVIEW

In this lesson, students will learn about the Native groups whose land they are on, Indigenous Knowledge practices, and how Native ways of caring for land contrast modern industrial agriculture systems. Students will use community gardens as models for expanding on the ways agriculture can include communal practices and Indigenous Knowledge.

VOCABULARY

Community Gardens, Native Land, Land Access, Land Usage, Indigenous Knowledge, Land Acknowledgment,

MATERIALS

- Lesson 4: Land Usage Slides
- L4 Activity 1
- L4 Activity 2
- Computers, tablets, or personal devices
- Chart paper & drawing supplies (*optional)*

Notes to Facilitator

This is a great lesson to do outside if possible. If you have a community garden near or operated by your school, complete Part 2 using that garden space as your model.

Part 2 of this lesson can be an extension or a take-home to allow more time for research and discussion during Part 1. If you need to wrap up after Part 1, use the discussion questions after Activity 1 for a wrap-up & reflection, or adjust to what feels right for you.

This lesson has an extension for Part 2 that can be completed in a longer class period or as a take-home assignment.

Grade Level: 9-12
Time: 45 mins

Key Questions

- What Native land are we on?
- What are the key differences between Indigenous practices and industrial farming practices?
- What are community gardens?
- What communal and Indigenous land use practices can we bring into our vision for urban food production?

Students will…

- Learn about the history of their land and the Native groups who steward it.
- Understand how traditional land knowledge impacts food access, public health, climate change, and the environment.
- Research community gardens and Indigenous land practices to further develop their food access initiatives.

NYS Standards

New York State P-12 Science Learning Standards
HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of
natural hazards, and changes in climate have influenced human activity.

ESS3.C: Human Impacts on Earth Systems
The sustainability of human societies and the biodiversity that supports them requires responsible management of natural resources. (HS-ESS3-3)

Next Gen ELA/Literacy
11-12.RST.2 Determine the key ideas or conclusions of a source; summarize complex concepts, processes, or information presented in a source by paraphrasing in precise and accurate terms.

11-12SL1: Initiate and participate effectively in a range of collaborative discussions with diverse partners on complex topics, texts, and issues; express ideas clearly and persuasively, and build on those of others.

Social Studies
11.1 a Contact between Native American groups and Europeans occurred through cultural exchanges, resistance efforts, and conflict.

LESSON TASKS

Warm-up (5 min)

- Have students type in native-land.ca into their smartphones or other devices to find out what Native land they are on. Students can enter their home zip code and should be encouraged to zoom in and out and explore the map.
- If there's time, everyone should see if they can find and share one fact about the Native tribe(s) whose land they're on.

Part 1: Land Usage in NYC (20 min)

Background (5 min):

- Using the Lesson 4: Land Usage slides, run through the background slides as a class, reading from the slide notes as you go.

Activity 1 (10 min):

Students will examine a quote from The Cree Tribe of North America and will consider how it impacts food access, public health, the environment, or climate change in contrast with industrial farming practices.

Quote: "One of the things that modern agriculture lacks is respect, respect for the soil, and respect for the plants, the insects, the animals, and the microorganisms that enrich the soil. And even respect for the people who eat their food. Modern agriculture seeks to control everything, which it cannot do. Native Americans had a much greater understanding of and respect for the circle of life. Only when the last tree has died and the last river has been poisoned and the last fish has been caught will you realize you cannot eat money." - *The Cree Tribe*

- Read the quote together as a class.
- Assign table groups or small groups one of the following terms:
  - Term 1: Food Access
  - Term 2: Environment
  - Term 3: Public Health
  - Term 4: Climate Change
- Have groups complete the L4 Activity 1 worksheet using their assigned term. If they need help defining their term, they can use computers or personal devices to find a definition.
- Take some time to share as a class if time permits.

Discussion Questions:

- Is there a way for Indigenous knowledge to exist in tandem with industrial agriculture? If so, what do you envision that looks like?

Part 2: Growing Community in Community Gardens (20 min)

Much of the agriculture we see today has been influenced by Indigenous Knowledge, which prioritizes care and attention to all living things in the environment. Community gardens are one of the ways that communities in urban spaces have transformed access to land and public space, and in turn, supported the health of our climate and communities. This activity will allow you to explore community gardens more in-depth and think about how Indigenous knowledge and healthy land use practices can be incorporated into your farm business.

Activity 2 (20 min):

- Break students into small groups
- Give each student L4 Activity 2, and a laptop or way to access the internet for research purposes.

Wrap-up & Reflection (5min)

- Create a statement of purpose (kind of land acknowledgment) for your vision of growing on the land you are on. Record it somewhere students can reference it later.

ACTIVITY EXTENSION

L4 Activity 2 Extension

Draw and design a growing space that incorporates community garden and Indigenous practices, expanding on your urban production plan from Lesson 3

Guiding Questions:

- What would it look like to grow food today using Indigenous knowledge practices?
- What would a growing space made by and for your community look like?
- How can you improve your plan for the urban farm? Think about accessibility, community relations, Indigenous knowledge, etc.
- What are some additional structures or components that would holistically support the community?

Note: This extension can also be found on the L4 Activity 2 lesson page

L4 Activity 1: Indigenous Knowledge, Agriculture & the Environment

Step 1: Using the quote below, consider what the author believes are the major differences between Indigenous knowledge and modern (industrial) agriculture.

"One of the things that modern agriculture lacks is respect, respect for the soil, and respect for the plants, the insects, the animals, and the microorganisms that enrich the soil. And even respect for the people who eat their food. Modern (Industrial) agriculture seeks to control everything, which it cannot do. Native Americans had a much greater understanding of and respect for the circle of life. Only when the last tree has died and the last river has been poisoned and the last fish has been caught will you realize you cannot eat money." - The Cree Tribe

In one sentence…

Indigenous Knowledge: _____

Modern (Industrial) Agriculture: _____

Step 2: Now, define the term your group was given to explore more in-depth:

Term: _____

Definition: _____

Step 3: Using what you know about modern agriculture and Indigenous Knowledge, how do you think these different ways of thinking and producing food impact your term?

For example, how does growing using industrial practices affect climate change, or, how does growing using Indigenous knowledge affect climate change? It's okay if you aren't entirely sure but use your best judgment to list a few things.

Term:	
Indigenous Knowledge	Modern Agriculture

L4 Activity 2: Growing Community in Community Gardens

Introduction
How we use and tend to land impacts our health, the environment, the climate, and our access to nutritious foods. Indigenous knowledge has taught farmers and growers a lot about growing in harmony with the environment. Today, we can see a clear connection to Indigenous knowledge in many farming and gardening practices, especially in urban areas like NYC.

One clear connection is in community gardening. Community gardens serve to provide quality-of-life services to community members. Having access to green space is a human right and rallies against all systems that would profit from or restrict people's connection to nature and food. In NYC, an impressive amount of unconventional farming takes place at community gardens throughout the five boroughs. There are over 500 community gardens on city property, over 860+ school gardens, over 100 gardens in land trusts, and 700 gardens at public housing developments throughout New York City.

Community gardens are where the residents of a community are empowered to design, build, and maintain spaces in their communities. A community garden can be urban, suburban, or rural. Community gardens are one of the ways that communities transform access to land and public space, which in turn, supports the health of our environment, people, our climate, and even enhances food access and food justice initiatives.

Next, you will expand on your urban farm and food access point planning by researching a community garden near your school or home to learn more about it and the Native land it's on. Your goal is to design an urban farm space that incorporates everything you've learned so far.

Step 1: Using GreenThumb's community garden map, find out where the closest community garden is to your house, or, if you're using the community garden near your school, search for that in the search bar. You can use a zip code to find the garden.

Answer the following questions about your community garden:

What is the garden called? What community does that garden serve?

_____

How long has the garden existed? If available, what is its origin story?

_____

What things are grown in the garden? What growing practices do they use?

_____

What benefits would someone get if they became a member of the community garden?

_____

Step 2: Using Native Land Digital's Native Land map, identify what Native land the community garden is on by typing the garden's zip code into the search box.

Native Tribe(s):

_____

Now, add the following question to your community garden research:

What are some traditional land practices and agricultural practices used by the native tribes of the land they're on?

_____

_____

_____

Activity Extension
Draw and design a growing space that incorporates communal and Indigenous practices or ideas and expands on your urban farm plan from Lesson 3. Begin by answering the following questions, then, draw your garden vision.

Guiding Questions:

- How can you improve your plan for the urban farm?
- What would it look like to grow food today using Indigenous Knowledge practices?
- What are some additional structures or components that would holistically support the community you are seeking to serve?

Lesson 5: Food Sovereignty and Agroecology

OVERVIEW

In this lesson, students will explore the nuances of the global food movement through concepts like food sovereignty, agroecology, food forests and Indigenous Forest gardens, peasant farming, the peasant food web, and community-centered farms. Lastly, they will then brainstorm a collective vision for food sovereignty within their local community.

VOCABULARY

Food Sovereignty, Agroecology, Forest Gardens, Indigenous Food Forests, Peasant Farming, Community-Centered Farming

MATERIALS

- Lesson 5: Food Sovereignty and Agroecology Slides
- L5 Activity 1
- Lesson 5 Background Reading Sections (printed for students)
- These Gardens Are Blueprints - by Naima Penniman
- Computers, tablets, or personal devices
- Paper and drawing materials
- Collage materials, printer, additional art supplies (*optional)*

Note to Facilitator

Part 2 of this lesson can be an extension or a take-home to allow more time for research and discussion during Part 1. If you need to wrap up after Part 1, use the discussion questions after Activity 1 for a wrap-up & reflection, or adjust to what feels right for you.

Some background reading sections contain hyperlinks for videos and other learning materials. If you print these sections, students may want to use something to access the internet while reading.

Grade Level: 9-12
Time: 45 mins

Key Questions

- What is food sovereignty?
- What is agroecology?
- What have global food movements contributed to agriculture?
- What visions do we have for food sovereignty in our community?

Students will…

- Explore global food sovereignty movements.
- Understand the importance of community-driven food movements globally and locally.
- Identify a collective vision for food sovereignty in our communities for our farm business.

NYS Standards

Next Gen ELA/Literacy

11-12.RST.2 Determine the key ideas or conclusions of a source; summarize complex concepts, processes, or information presented in a source by paraphrasing in precise and accurate terms.

11-12SL1: Initiate and participate effectively in a range of collaborative discussions with diverse partners on complex topics, texts, and issues; express ideas clearly and persuasively, and build on those of others.

11-12W4: Create a poem, story, play, artwork, or other response to a text, author, theme or personal experience; demonstrate knowledge and understanding of a variety of techniques and genres. Explain connections between the original and the created work

Social Studies

10.8 a Cultures and countries experience and view modernization differently. For some, it is a change from a traditional rural, agrarian condition to a secular, urban, industrial condition. Some see modernization as a potential threat and others as an opportunity to be met.

Social-Emotional

2B. Recognize and affirm individual identities as well as individual and group similarities and differences, including those rooted in culture, ethnicity, race, religion, sexual orientation, gender identity or expression, ability, etc.

LESSON TASKS

Warm-up (5 min)

- Watch the video found in the slideshow, These Gardens Are Blueprints - by Naima Penniman, as a class.

Discussion Questions:

- What do you think Naima Penniman meant by “these gardens are blueprints”?
- How would you describe, in your own words, Naima Penniman’s vision for our food system?

Part 1: What is Food Sovereignty and Agroecology? (20 min)

Background (5 min):

- Using the Lesson 5: Food Sovereignty and Agroecology slides, run through the background slides as a class, reading from the slide notes as you go.

Activity 1 (15 min):

- Divide the class into four groups (it’s okay if more than one group is reading the same background section):
  - Group 1: The Food Sovereignty Movement
  - Group 2: Indigenous Food Forests and Forest Gardens
  - Group 3: Peasant Farming and the Peasant Food Web
  - Group 4: Community-Centered Farms
- Give each member of the group an L2 Activity 1 worksheet, their assigned background reading materials, and a computer or way to access the internet.
- Have the groups share what they learned and why their topic is an important component of food sovereignty and agroecology.

Part 2: Our Vision of Food Sovereignty (15 min)

Create a collective vision for food sovereignty. This can be done over a Google slide where individuals post a photo from the internet on a shared slide, or members can draw something for one big classroom collage. You can allow more time if you want to extend this activity.

Activity 2 (15 min):

- Ask students to draw or find an image that represents what they envision food sovereignty can look like in their community. Use your imagination!
- For example, if you think that the trees on the street should all be food trees and people should be able to pick and grow food in public spaces, draw or find a picture that represents this.
- If students are feeling stuck, you can begin with a prompt such as “Food Sovereignty to me is…”
- Once everyone has their image, allow the opportunity to share their vision, as you create one large collage of your collective vision of food sovereignty.

Wrap-up & Reflection (5 min)

- How will your farm business address food sovereignty in addition to food access? What does that look like for your school community?

Background Section 1: The Food Sovereignty Movement

Food sovereignty believes that all people have the right to food and the right to shape their food system. The goal of food sovereignty is for communities to thrive more independently and not rely on larger, global systems for the resources they need.

Food sovereignty is typically organized around small-scale farming, as opposed to large-scale farming or industrial agriculture.

In 2007, food sovereignty stakeholders gathered at the Nyéléni Forum for Food Sovereignty in Selingue, Mali, where they established the 'Six Pillars of Food Sovereignty' which include:

- Focuses on food for people
- Values food providers
- Localizes food systems
- Puts control locally
- Builds knowledge and skills
- Works with nature

La Via Campesina is a global food justice and peasant's rights organization that describes food sovereignty as follows:

"There is no one-size-fits-all solution to the complex problems we face in today's world. Instead, Food Sovereignty is a process that adapts to the people and places where it is put in practice. Food Sovereignty means solidarity, not competition, and building a fairer world from the bottom up... The concept of Food Sovereignty was developed by peasant farmers. Instead of being destroyed by the forces of history they are offering a proposal to solve the multiple crises which humanity is facing."
- La Via Campesina

Figure 6: La Via Campesina

Watch this video to learn more about food sovereignty, produced by NowThis Earth.
As mentioned in the video, food sovereignty is typically organized around small-scale farming, as opposed to large-scale farming or industrial agriculture.

Background Section 2: Indigenous Food Forests and Food Gardens

Indigenous Food Forests and Forest Gardens are a culturally based food system practice some Indigenous peoples around the world have nourished and sustained since time immemorial. Indigenous communities are diverse and complex, comprising more than 4,000 languages and cultures, and have equally diverse practices when it comes to the development and maintenance of their food systems.

Forest farming is a practice of growing, maintaining, and utilizing forested areas for producing and harvesting crops for culinary, medical, and cultural uses, which in turn provide sustenance, shelter in a sustainable and regenerative way. Food forests differ from traditional agriculture as they regenerate the landscape and add biodiversity through perennial planting. Over the last 300 years, settler agricultural practices utilized by industrial farms today have removed up to 70% of the perennial landscape that covered this continent.[1]

Food forests do the opposite. Comprising hundreds of species of trees, shrubs, and groundcover, they restore ecosystems by capturing carbon from the atmosphere and providing habitat for biodiversity and sustenance for Indigenous peoples.

Watch this video on the Sengwer people who steward Indigenous Forest gardens being displaced by the Kenya Forest Service despite the critical, symbiotic role the community plays in maintaining forest health.

Another example of an organization working to restore Mayan food forest practices is IMAP, or Instituto Mesoamericano de Permacultura (Mesoamerican Permaculture Institute). They are a training ground and seed bank in Guatemala. Learn more about their campaign for farmers to save seeds and thereby biodiversity in this video.

Figure 7: Backyard Food Forest

Background Section 3: Peasant Farming and the Peasant Food Web

Peasants are usually considered small-scale farmers, often women-led families, who live off the land either through farming, fishing, livestock keeping, or other food ways. While peasants may be classified socio-economically living in poverty, peasants often have more power over their food system which means they are often less at risk from exploitation in our capitalist system.

Exploitation of low-income people is closely tied with the need for income to meet basic needs, like food. If you are in control of your source of food, in this case by growing it yourself in your community, you are less reliant on the mainstream economy and external income sources. Thus, peasants can often lie outside of the capitalist system because they grow food for their community. In fact, roughly 4.5 - 5.5 billion people in the world depend on the Peasant communities for their food, that's about 70% of the world's population.[2]

Globally, peasants are responsible for maintaining crop diversity historically:

"Peasants are safeguards for agrobiodiversity, biocultural diversity, and traditional agricultural knowledge that fosters a relationship of reciprocity, with the land, water, soils, non-human kin, and microbial diversity. Peasants also care for seeds, contributing to global seed diversity by protecting and sometimes interbreeding 50,00 - 60,000 wild relatives of cultivated species at no cost." - CC Futures

Case study: Watch this video!

Figure 8: Peasant Farming in Lower Nyando

Background Section 4: Community-Centered Farms

Naturally, community-centered farms are farms that first and foremost center the needs of the communities in which they are composed. There are many ways this can manifest in a community because needs across different communities can vary greatly.

Community-centered farms often incorporate a CSA - Community Supported Agriculture program, where community members promise payment to farmers in exchange for a portion of their production all season long; this form of exchange helps minimize risk for farmers and helps local communities access fresh nourishing food over a long period. Many farms have also moved to a sliding scale payment option for their CSAs allowing more people to access nourishing foods grown in their community. Another program many community-centered farms incorporate is training and community engagement programs.

An example of a community-centered farm in New York City is Red Hook Farms. They are a youth-centered urban farm and food justice program in Red Hook, Brooklyn. They incorporate a CSA along with teen farm apprenticeships, farmstands, and school workshops to “transform vacant lands into vibrant urban farms, improve access to healthy, affordable produce, and nurture a new generation of green leaders.”

Figure 9: Youth participating in the Red Hook Initiative

L5 Activity 1: Reading Worksheet

Step 1: Read through your assigned background section(s) and take notes on the document or in the note space below. Do your best to find 2 interesting facts from each section you read.

What background section(s) are you reading:

_____

Step 2: Share what you learned with your group and make notes of each other's thoughts in the note section above, or below:

Notes:

Step 3: Now, your group will research specific examples of groups doing work within your topic and related to food sovereignty here in NYC. It's okay if the group you find is located within the region surrounding NYC.

See if you can answer some of the questions below:

Name of the group or organization:

_____

What is the group's goal?

_____

Who are they and who are the communities impacting?

_____

How are they addressing food sovereignty?

_____

What are some other ideas they could implement to make their movement stronger?

_____

Do you feel personally connected or identified with any specific group?

_____

Lesson 6: Farming, Food, and Racial Justice

OVERVIEW

In this lesson, students will explore contributions made by Black and Brown activists, agriculturalists, and inventors to contextualize the modern-day food system and food justice movements. Students will take time to reflect on Black and Brown figures, past and present, through a writing and art activity.

VOCABULARY

Racial Justice, Activist, Agriculturalist, Food Justice

MATERIALS

- Lesson 6: Farming, Food, and Racial Justice Slides
- L6 Activity Worksheet (for Activity 1, Option 2)
- Lesson 6 Background Reading Sections (printed for students)
- Post-it notes or index cards and tape
- Notebooks or blank paper

Note to Facilitator

This lesson can be completed in two different ways. One option is geared towards group discussion and the other individual reflection. Decide what works best for your classroom community, and feel free to mix and match. There is only one activity for this lesson to allow lots of time for personal reflection.

LESSON TASKS

Warm-up (5 min)

- Ask students to reflect on a Black or Brown person, activist, mentor, or family member who has influenced their lives in some way. Allow students to share in a turn and talk.

Grade Level: 9-12
Time: 45 mins

Key Questions

- What are some African contributions to the food system and food movements?
- What Black and Brown stories, personal or historical, do we feel resonate with us or with our farm business?

Students will…

- Explore how, through different periods, Black and Brown people have successfully impacted agriculture and the world.
- Critically reflect on a certain Black or Brown historical figure or moment from history that they feel personally resonates with them.

NYS Standards

Next Gen ELA/Literacy

11-12.RST.2 Determine the key ideas or conclusions of a source; summarize complex concepts, processes, or information presented in a source by paraphrasing in precise and accurate terms.

11-12W4: Create a poem, story, play, artwork, or other response to a text, author, theme or personal experience; demonstrate knowledge and understanding of a variety of techniques and genres. Explain connections between the original and the created work.

11-12W5: Draw evidence from literary or informational texts to support analysis, reflection, and research.

Social Studies

11.7 b African Americans continued to struggle for social and economic equality while expanding their own thriving and unique culture. African American cultural achievements were increasingly integrated into national culture.

11.10 b Individuals, diverse groups, and organizations have sought to bring about change in American society through a variety of methods.

Social-Emotional

2B. Recognize and affirm individual identities as well as individual and group similarities and differences, including those rooted in culture, ethnicity, race, religion, sexual orientation, gender identity or expression, ability, etc.

Part 1: Food, Farming, & Racial Justice (35 min)

In this activity, students will explore different African contributions to agricultural society throughout history and will reflect on how they may have been directly impacted by various inventions and activist leaders. Students will share their impressions of the activist, period, or invention and its impact on agricultural and societal advancements through a letter or a drawing.

Activity 1 (35 min):

Option 1: Timeline Reflection

- Using the slideshow or a whiteboard or large piece of paper at the front of the room, draw a timeline arrow and label the left far end "BCE" and the right far end "Present Day."
- Break the class into 6 or more groups and assign each group a background section to read. Hand each member of each group their respective background sections:
    - Group 1: Egypt
    - Group 2: Resistance to Colonization & Enslavement
    - Group 3: George Washington Carver
    - Group 4: Fannie Lou Hamer
    - Group 5: Black Farmers in the South
    - Group 6: Rise of Urban Agriculture Today
- Hand each group 2-4 Post-it notes or index cards and some writing materials.
- Instruct groups to read their section and write down three notable facts or things they learned about their period using the Lesson 6 Worksheet
- Give each group some time to come together and land on 2-4 key points they took away from their background reading. Record one idea per Post-it or index card.
- Have groups take turns approaching the whiteboard to place their cards and read aloud to the class.
- Next, ask students to choose one activist or period that interests them and write a letter or draw a picture that relates to them, their work, their impact on society, or you. Students should be given this time to think critically about their feelings and how this topic resonates with them.

Option 2: Individual Reflection

- Give each student a set of background information to read (this should include all 6 sections).
- Have everyone read through the different snapshots of history making notes about each section using the L6 Activity worksheet.
- Take a couple of minutes to share things that people read or learned about activists or historical periods.
- Next, have students choose which activist or period to explore more in-depth.
- Write a letter or draw about the topic or person you choose. Draw a picture of anything related to them, their work, and their impact on society. Talk about some of the key takeaways and how it makes you feel. Students should be given this time to think critically about their feelings and how this topic resonates with them.

Wrap-up & Reflection (5 min)

- How do these important contributions tie into food access, land access, and food sovereignty?
- Is there more information you want to learn, or feel is relevant to your farm business or school community?

Background Section 1: Egypt (BCE)

The story of farming for African people can be traced back to the beginning of time. We'll start our exploration in Ancient Egypt, transporting us to the realm of agricultural advancement. Canals and waterway systems that utilized the Nile River, clay roads, and cities that thrived on the water, inventions, and intentions were woven into Egyptian-style farming. Egyptians handcrafted fine luxury items from bronze, ivory, gold, and terracotta for both local and trade use. From there we see farming start to take shape and continue to be used for spiritual practices and more than often as a form of social status.

Farming has existed since the beginning of humanity; one example of an early farming community was Egyptian farmers. Egyptian farmers believed that the Nile River provided for them; evidenced by the fact that the river would flood over every year and deposit nutrient-rich soil on the land. The river made it the ideal environment to grow their crops. Some of the main crops grown in ancient Egypt were flax, barley, wheat, figs, cabbage, lettuce, and pomegranates. The most dominant crops grown were grain and barley since they were used primarily to make beer. Flax was also grown so that farmers could produce linen.

Figure 10: Ancient Egyptian farmers

Egyptian culture depended heavily on the Nile River and even developed folklore surrounding the god and the river. Osiris, also known as the Egyptian Lord of the Underworld; the Lord of Love, King of the Living and Eternal Lord was often depicted with black or green skin symbolizing the fertile mud of the Nile and regeneration. When the river would flood, farmers would fish for food or eat other livestock they cared for like, geese, pigs, goats, oxen, ducks, and cows. Farmers also used the flooding to keep certain areas well saturated and prevent fields from drying out under the sun. Farming was not only a task but ingrained in their way of life, from the evolution of the heavy and light ox-drawn plow to their intricate irrigation system. Irrigation canals were used to carry water to outlying farms and villages as well as to maintain crops near the river. These canals are the foundation for modern-day irrigation practices used in the 20th century. To learn more about Osiris, click here.

Background Section 2: Resistance to colonization and enslavement

Few people identify slavery with the cultivation of rice, yet rice was a major plantation crop during the first three centuries of settlement in the Americas. Rice accompanied African enslaved people across the Middle Passage throughout the New World to Brazil, the Caribbean, and the southern United States. By the middle of the eighteenth century, rice plantations in South Carolina and the Black enslaved farmers who worked for them had created one of the most profitable economies in the world.

Unfortunately, it is a commonly held belief that Europeans introduced rice to West Africa and then brought the knowledge of its cultivation to the Americas. Not only is that assessment incorrect, but it also operates to undermine the origins and cultivation of rice. Africans and African American enslaved people were transferring the seeds, the cultivation of skills, agricultural advancement, and the cultural practices necessary for growing those crops in the New World.

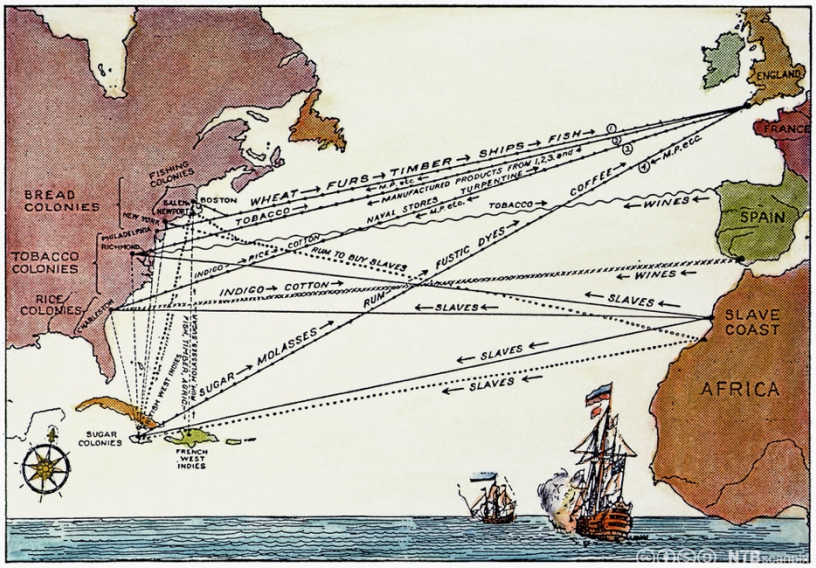


Figure 11: Transatlantic slave trade map

Professor Carney's book, Black Rice, tells the story of African women braiding their hair and hiding rice seeds as well as other grains in their cornrows.

"According to in-depth research conducted by Judith Carney, a rice historian and geography professor at the University of California, Los Angeles, revelations indicate that some enslaved people were fully prepared to be captured or had enough time to store the grains on their body before being kidnapped and forced from their homes. In her book Black Rice, Professor Judith A. Carney gives a full account of the dark and hard grained rice that came from West Africa and how enslaved farmers taught their white captors how to grow and preserve it years before rice from Asia became a preferred option…"[3]

Mothers often braided the rice into their children's hair, ensuring survival if they were enslaved or escaping from raided communities in Africa. Other crops saved were black eyed beans, small cassava cuttings, maize and other grains depending on how thick the hair was. During the years of several slavery rebellions in the Caribbean, this practice was taken up by African Maroons farmers who escaped plantations to start their own settlements where they grew food and live independently. To explore more African braiding styles click here, and to watch a video on black hair click here.

Background Section 3: George Washington carver: scientist, farmer, teacher, and civil Rights activist

George Washington Carver was an agricultural scientist and inventor who developed hundreds of products using peanuts, sweet potatoes, and soybeans (unfortunately he did not invent peanut butter). George was born in 1864, a year after slavery was outlawed. He was young when he and his family were kidnapped. He was later retrieved by the owner of the plantation he was born on and raised by the owner and his wife.

At a young age, George had an interest in plants and experimented with natural pesticides, fungicides, soil conditioners and soil amendments. He became known as the plant doctor to local farmers because of his ability to improve the health of their gardens, fields, and orchards. He would later leave the plantation and study agriculture at various high schools, constantly traveling through the Midwest and using his knowledge of agriculture and housework for room and board. George initially studied art and piano in hopes of earning a teaching degree, but one of his professors encouraged him to apply to the Iowa State Agricultural School (now Iowa State University) to study botany.

Figure 12: George Washington Carver

In 1896, George Washington Carver received his Master of Agriculture degree and immediately received several offers, including one from Booker T. Washington of Tuskegee Institute (now Tuskegee University) in Alabama. Carver convinced the University's trustees to establish an agricultural school, with the stipulation that Tuskegee was to keep its all-Black faculty if he taught there. He would later accept the offer and would work at Tuskegee Institute for the rest of his life.[4]

Some of George Washington Carver's greatest inventions included:

- Feeding acorns to hogs (animal husbandry) instead of commercial feed
- Use of natural fertilizers such as swamp muck etc.
- Crop rotation techniques
- Jessup wagon (mobile classroom and laboratory to demonstrate soil chemistry)
- Flour (from sweet potatoes)
- Vinegar (from sweet potatoes)
- Stains, dyes, paints, and writing ink
- More than 300 food items, industrial and commercial products from peanuts, including milk, Worcestershire sauce, punches, cooking oils and salad oil, paper, cosmetics, soaps and wood stains. He also experimented with peanut-based medicines, such as antiseptics, laxatives, and goiter medications.

Through his work, George Washington Carver provided farmers with the agency and education that they needed to prosper! Check out the George Washington Carver National Monument here.

Background Section 4: Fannie Lou Hamer: civil and voting rights activist, singer, farmer, and community organizer

Fannie Lou Hamer was born in 1917, to Lou Ella and James Lee Townsend, sharecroppers east of the Mississippi Delta. She first joined her family in the cotton fields at the age of six, forced to pick hundreds of pounds of cotton a day. She managed to complete several years of school, learning how to read and write, a skill that would support her later in her life. Sharecropping was a system where an owner and a tenant farmer agreed; on land usage to grow crops in exchange for a portion of the harvest as well as room and board. This forced tenant farmers to work to produce the largest harvest that they could, to have enough for themselves and the portion owed to the owner. These predatory practices ensured that tenant farmers stayed tied to the land, in debt, and made it unlikely for them to leave for other opportunities.

In the early 1940s, Fannie married Perry (Pap) Hamer and worked alongside him at W.D. Marlow's plantation near Ruleville, in Sunflower County. After suffering from intentional medical malpractice and being unable to have children of their own the Hamer's adopted two children. In the 1960's Fannie's influential career as a civil and voting rights activist took off. From supporting Black voters in South Carolina to sit-in protests at white-only restaurants, and later as the co-founder of the Mississippi Democratic Party. From 1964 - 1968, Hamer would go on to support more legislative change, as well as being an inspiration for the Civil Rights Movement with her song, This Little Light of Mine. Fannie Lou Hamer's Congressional testimony was so powerful that President Johnson called an impromptu press conference to get her off the air. But his plan backfires, check out the video here.

Figure 13: Fanny Lou Hamer

In 1969, Hamer founded the Freedom Farm Cooperative with a $10,000 donation from a charitable organization. They purchased 40 acres to empower poor Black farmers and sharecroppers, who had been at the mercy of the local white landowners. "The time has come now when we are going to must get what we need ourselves. We may get a little help here and there, but in the main we're going to have to do it ourselves." The Freedom Farm was dedicated to grassroots participation, liberation, and economic sovereignty for Black farmers. "All the qualifications that you must have to become part of the co-op is you must be poor. This is the first kind of program that has ever been sponsored in the country in letting local people do their thing themselves."[5]

In 1970, the co-op purchased an additional 640 acres for cultivation. The organization also started a pig bank. With funds from the National Council of Negro Women, the co-op bought 35 female pigs and five boars. Over the next three years, the pig bank produced thousands of new pigs to feed impoverished families. The other purpose of the pig bank was to provide farmers with the collateral to purchase more land, resources and to increase the property value of their farms. Unfortunately, the farm was not able to sustain itself and was forced to dissolve due to lack of institutional backing, and lack of additional commercial ventures to keep the project afloat. To learn more, click here.

Background Section 5: Black farmers in the south

Throughout American history, African American farmers have suffered trials of discrimination and racist policy that have made it difficult to obtain, keep, and work farmland. Discriminatory practices ranged from predatory lending and high interest rates from Banks, unjust conditions and policies in factories, USDA, and the exclusion from government programs like the American Homestead Act and GI Bill. There were instances where the U.S. government pledged to grant land to Black farmers, but those prospects were short lived and swiftly revoked and given to white confederates instead.

One example is the famous “40 acres and a mule” promise, originally granted by William T. Sherman in 1865 to provide adequate farmland to African Americans from Charleston, South Carolina to Florida. In this order 400,000 acres of land was designated to be distributed to newly freed enslaved African Americans; support would be provided from the military. African Americans would have full agency of what happened on their land. However, Andrew Johnson would later overturn this decision, because of his sympathy for the white southern confederates, thus forcing the already established Black farmers off their land. To learn more about the truth behind 40 acres and a mule, click here.

Figure 14: Black Farmers in the South

In the 1920s, 14% of farm owners were Black or African American, now that percentage is down to 2% due to historically unfair and racist practices. According to the NY Times “The Jim Crow era brought about a violent backlash from white landowners; Black farmers and sharecroppers became the target of their intimidation, fatal bombings, and other attacks. The discrimination and racial violence spurred many Black farmers to flee North, often to cities, as part of the Great Migration. Disparities in access to loans and aid, and well-documented discrimination at the Department of Agriculture, also drove Black farmers from their land. Even as the Civil Rights era started to bring Black Americans equal rights under the law, the rural exodus accelerated as white citizens’ councils in the South, wary of a surge in Black voters, explicitly targeted Black farmers for expulsion from their communities.”

Land lost by Black farmers was an estimated 90% decline from the early 20th century, according to the Land Loss and Reparations Project, as white-owned acreage has shrunk only by 2%.[6]

Background Section 6: Rise in urban agriculture today

Black steward and community gardens have been providing agency to community members with spaces like Brook Park Community in the Bronx. Offering alternatives to incarceration, canoeing in the Bronx River, access to ancestral growing practices, tire swings and more. Community leaders have been instrumental in supporting growers through the Small Axe initiative which pays farmers for peppers that are used to make Bronx Hot Sauce. As well as providing residents with access to green spaces and community building. A large part of the initiatives surrounding Black growing spaces involves connecting Black and Brown folks to nature and showing the healing power of the earth. To date, Black and Brown communities continue to face more facets of environmental racism such as exclusion from green spaces and lack of knowledge on healthy eating habits compared to many other racial groups.

Small community spaces provide farmers with the ability to make direct impacts on their immediate community and collaborate with other gardens and farms in their communities. Black farmer collective groups and conferences including Black Urban Growers conference, also known as BUGS created by farmer and activist Karen Washington and other elite Black farmers offer community and stewardship building opportunities. There has also been an investment into the Urban Agriculture community through training youth programs like Green City Force and Red Hook Farms.

Black farmers as a collective force have been setting up farms in isolated areas of upstate NY to directly impact the food system of more New Yorkers. In addition, they have been working directly in the Tri-state area, to impact local food policy and disrupt the current food system. These policy initiatives include addressing the history of discrimination against Black farmers and ranchers, as well as calling for drastic reforms within the Department of Agriculture to prevent future discrimination. The policies would support farmers who have been victimized due to discriminatory and unfair practices, help farmers access funds easier, and provide a fund to encourage more Black and Brown farmers to connect back to the land. To learn more about the policy shaping urban farming, click here.

Figure 15: Phoenix Community Urban Farm

Growers have also related to mutual aid projects like Community Fridges to prevent food waste and combat food insecurity within their communities. Other waste management initiatives such as recycling programs by the Inner City Green Team and composting by BK Rot, Red Hook Farms, Compost Power etc., improve quality of life and help to combat climate change.

L6 Activity 1: Reading Worksheet

Section Title:	
How did the person, group, or period change the agricultural industry?	Where would the industry be without that invention or societal contribution?
How do you connect with this person, period, or invention?	What information is missing? What else can we learn from this contribution?

Section Title:	
How did the person, group, or period change the agricultural industry?	Where would the industry be without that invention or societal contribution?
How do you connect with this person, period, or invention?	What information is missing? What else can we learn from this contribution?

Lesson 7: Food, Farming, and Climate Change

OVERVIEW

In this lesson, students will learn about how climate change connects to the food system through exploring climate-conscious farming practices. Students will incorporate these practices into their farm business thinking.

VOCABULARY

Climate Change, Agroecology, Renewable Energy Seed Keeping, Irrigation Systems, Native Plants, No-Till Farming, Permaculture

MATERIALS

- Lesson 7: Farming, Food, and Climate Change Slides
- L7 Activity 1
- L7 Activity 2
- Computers, tablets, or personal devices

Note to Facilitator

Part 2 of this lesson can be done as an extension or a take-home to allow more time for research and discussion during Part 1. If you need to wrap up after Part 1, use the discussion questions after Activity 1 for a wrap-up & reflection, or adjust to what feels right for you.

This lesson has an extension for Part 2 that can be completed in a longer class period or as a take-home assignment.

Grade Level: 9-12
Time: 45 mins

Key Questions

- What is climate change?
- How will climate change impact our food system?
- How are farmers responding to climate change?
- What climate-friendly techniques can be incorporated into our farm business?

Students will…

- Understand the ways that climate change impacts our food system.
- Research practices that farmers are using to respond to climate change.
- Redesign their urban farm plan to incorporate climate-friendly practices.

NYS Standards

New York State P-12 Science Learning Standards
HS-LS2-7: Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity

HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems

HS-ESS3-5: Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems

Next Gen ELA/Literacy
11-12.RST.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

11-12SL1: Initiate and participate effectively in a range of collaborative discussions with diverse partners on complex topics, texts, and issues; express ideas clearly and persuasively, and build on those of others.

LESSON TASKS

Warm-up (5 min)

- Have students think of one word that comes to mind when they hear the term ‘climate change.’
- Turn and talk with the person next to them about the term they chose and have a couple of pairs share with the class.

Climate change is real and scary! Take time to acknowledge students' feelings and create space to discuss if you feel lots of people want to share. You can find resources to support these conversations in the Facilitator’s Guide.

Part 1: Food, Farming, and Climate Change (20 min)

Background (5 min):

- Using the Lesson 7: Food, Farming, and Climate Change slides, run through the background slides as a class, reading from the slide notes as you go.

Activity 1 (15 min):

How will climate change impact our food system? Students will examine real scenarios that focus on four major climate impacts in NYC. Students will also think about how these impacts will affect food production and food access in NYC.

Note: This activity can be done in smaller groups using the L7 Activity 1 worksheet or as a class using the slide deck

Option 1: As a Class

- Go through the slide deck, stopping at each scenario. Have students take turns reading each slide and answer the questions either in table groups or as a large class discussion.
- For each of the given scenarios consider the following questions on your worksheet sheet:
    - How do you think your climate scenario will affect growing food in NYC?
    - How do you think your climate scenario will impact food access across NYC?
    - Are there certain parts of NYC that will be affected more? Why do you think that is?

Option 2: In Groups

- Assign groups and give each group either one climate scenario to focus on, or, all four.
- Each member should fill out the Lesson 7 Activity 1 worksheet, answering the questions that follow each scenario.

Part 2: Responding to Climate Change (20 min)

Climate-friendly farming and gardening strategies can help mitigate the effects of climate change on our food system. Many of these practices were used by Indigenous peoples before colonization. We are seeing a return to these practices and therefore must acknowledge the fact that many of these practices are not new and were not created by White people. These strategies allow climate-friendly farms and local small-scale farms to improve the health of the environment and local ecosystems.

Activity 2 (20 min):

- Break out into groups and assign a climate-conscious farming practice to research:
    - Group 1: Seed Keeping
    - Group 2: No-till Farming
    - Group 3: Rainwater Catchment
    - Group 4: Solar Energy
    - Group 5: Native Plants
    - Group 6: Permaculture
- Give each group 1-2 laptops or tablets. Additionally, students can use their devices.
- Give each student an L7 Activity 2 worksheet, and in their groups answer the questions on the worksheet.
- If time permits, have each group share what they learned.

Wrap-up & Reflection (5 min)

- What climate-conscious practices do we want to incorporate into our farm business plan? Consider what resources are accessible to you and what time/space allows.

ACTIVITY EXTENSION

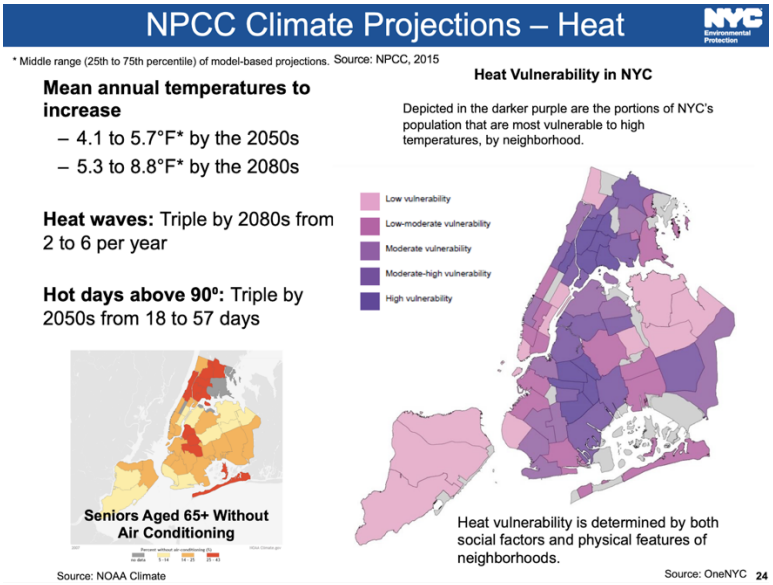
L7 Activity 2 Extension:

- In groups, create a short infographic, info sheet, poster, or flier, about your climate-friendly practice and how it can be incorporated into urban farm systems. Use your answers to the research questions to guide you. Leave time to share your infographic with the class.

Note: This extension can also be found on the L7 Activity 2 lesson worksheet

L7 Activity 1: Climate Change Scenarios

Scenario 1: Extreme Heat



How do you think your climate scenario will affect growing food in NYC?

_____

_____

How do you think your climate scenario will impact food access across NYC?

_____

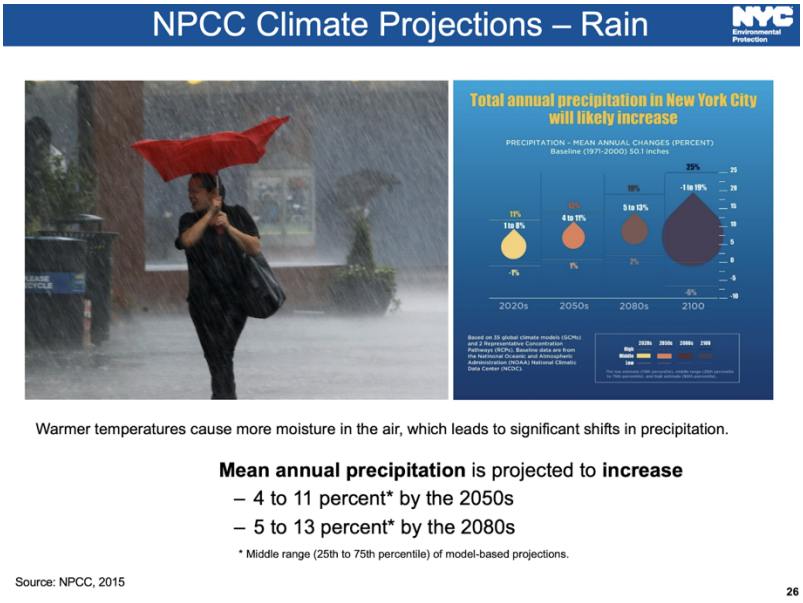
_____

Are there certain parts of NYC that will be affected more? Why do you think that is?

_____

_____

Scenario 2: Precipitation Increase



Warmer temperatures cause more moisture in the air, which leads to significant shifts in precipitation.

Mean annual precipitation is projected to **increase**
- 4 to 11 percent* by the 2050s
- 5 to 13 percent* by the 2080s

* Middle range (25th to 75th percentile) of model-based projections.

Source: NPCC, 2015

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How do you think your climate scenario will affect growing food in NYC?

_____

_____

How do you think your climate scenario will impact food access across NYC?

_____

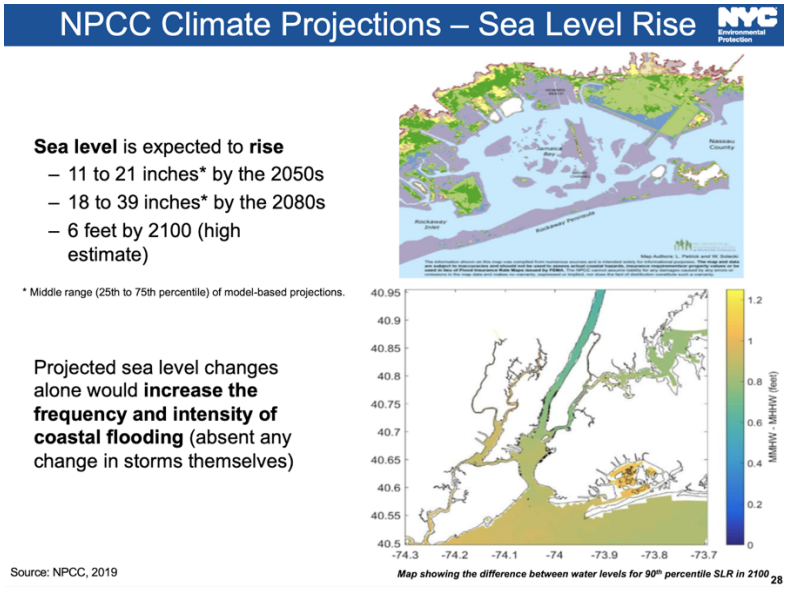
_____

Are there certain parts of NYC that will be affected more? Why do you think that is?

_____

_____

Scenario 3: Sea Level Rise



How do you think your climate scenario will affect growing food in NYC?

_____

_____

How do you think your climate scenario will impact food access across NYC?

_____

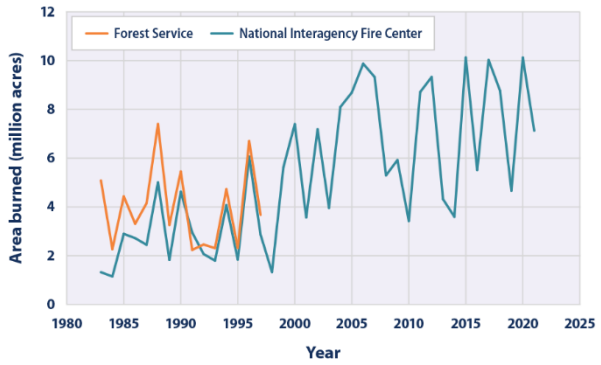
_____

Are there certain parts of NYC that will be affected more? Why do you think that is?

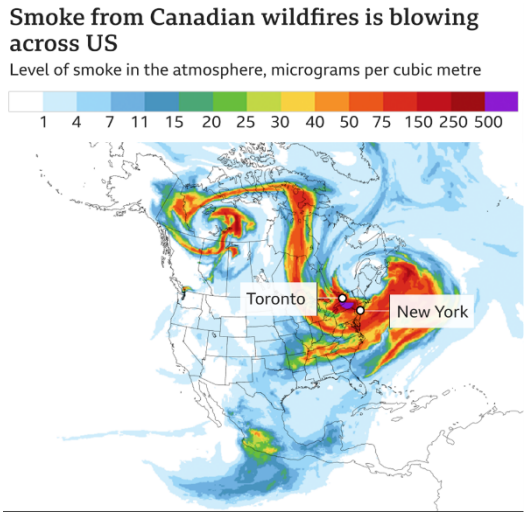
_____

_____

Scenario 4: Wildfires & Air Quality



Data source: NIFC, 2022;21 USDA Forest Service, 201422
Web update: July 2022



How do you think your climate scenario will affect growing food in NYC?

_____

_____

How do you think your climate scenario will impact food access across NYC?

_____

_____

Are there certain parts of NYC that will be affected more? Why do you think that is?

_____

_____

L7 Activity 2: Responding to Climate Change

Introduction
Think back to the idea of a stakeholder. Farmers are key stakeholders in our food system, and like us, they're work is intertwined with the environment, and therefore, is greatly impacted by climate change. Today, you are tasked with taking a deep dive into a specific farming practice that helps farmers mitigate climate change. To mitigate means to make something less severe or reduce the risks.

There are many climate-friendly farming and gardening strategies that can help mitigate the effects of climate change on our food system. A lot of the practices used today were invented by Indigenous people before colonization and are continued today. We are seeing a return to these practices and therefore must acknowledge the fact that many of these practices are not new and were not created by White people. These strategies allow climate-friendly farms and local small-scale farms to improve the health of the environment and local ecosystems.

Step 1: Circle or underline your groups assigned climate-conscious farming practice:

Seed-keeping No-till Farming Rainwater catchment Solar energy

Native plants Permaculture

Step 2: Conduct some research about your farming practice and answer the following questions:

Define your farming practice:

_____

Why is your practice beneficial for the climate?

_____

How can it be incorporated into urban farm systems?

_____

Are there any groups in NYC who currently use this practice?

_____

Where did this farming practice originate? See if you can find some historical information about it.

_____

Activity Extension
In groups, create a short infographic, info sheet, poster, or flier, about your climate-friendly practice and how it can be incorporated into urban farm systems. Use your answers to the research questions to guide you. Leave time to share your infographic with the class.

Lesson 8: Agriculture Science

OVERVIEW

In this lesson, students will learn the basics of agricultural science and will begin to think about actualizing their farm business ideas. Students will be asked to create asset maps for different farming methods, considering what tools, and resources are available to them in their community.

VOCABULARY

Agriculture Science, Seasonal Chart, Crop Planning, Community Asset, Asset Mapping

MATERIALS

- Lesson 8: Agriculture Science Slides
- L8 Activity 2
- Asset-map template
- GrowNYC Herb & Vegetable Planting Calendar
- Computers, tablets, or personal devices

Note to Facilitator

For this final lesson, students will take a deeper dive into a practical growing model for your hypothetical or real farm business. If you are already operating a growing space at your school, students can use this space as the focus for this lesson. If you are not growing food, you will explore different possibilities for growing at school. For either pathway, students will also explore possibilities for a food access point at your school.

If you are facilitating Option 1, please use the School Farmstand Manual as a supplemental material for facilitating this lesson.

Grade Level: 9-12
Time: 45 mins

Key Questions

- What is agriculture science?
- What is needed to grow food in NYC?
- What assets does our community already have for growing food and plants and what resources can we source from to grow food for our community?

Students will…

- Understand what agriculture science is.
- Understand the necessities for plant growth and growing food in NYC.
- Identify what tools, resources, and community assets are needed to grow food in their community.

NYS Standards

New York State P-12 Science Learning Standards
HS-ETS1-1: Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants

HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS-ETS1-3: Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts

Next Gen ELA/Literacy
11-12SL1: Initiate and participate effectively in a range of collaborative discussions with diverse partners on complex topics, texts, and issues; express ideas clearly and persuasively, and build on those of others.

Social-Emotional
3C. Take action to support the wellbeing of their school and community, including taking stands against bias and injustice.

LESSON TASKS

Warm-up (5 min)

- Using the NYC crop planning chart on your slide deck, or printed, have students make a list of everything they might need to grow one of the crops on this chart.

- Have some people share, recording answers on a piece of chart paper or on your whiteboard.

Discussion Questions:

- Where do we get all these resources?
- Are there certain things plants need to grow that we can use for "free" from our community, school, or living environment?

Part 1: What is Agriculture Science? (20 min)

Background (5 min):

- Using the Lesson 8: Agriculture Science slides, run through the background slides as a class, reading from the slide notes as you go.

Activity 1 (15 min):

One of the important first steps in creating a farm business is assessing what people, tools, and resources already exist within your community. This is called asset mapping and it's a valuable first step in considering how you will develop your farm business.

- Ask students to define an asset and why it is important.
- Next, reflect as a large group: What makes your community strong?
- Create one big mind map of all the ideas students come up with. This is the beginning of your asset map.
- Next, ask the group: How might these assets/our community support us in growing food and/or getting started with our farm business?
    - Hint: Think back to your initial thinking about stakeholders within your food system
- Draw a circle or underline assets from your mind map that might assist you with planning your farm business.

Part 2: Getting Started (20 min)

Students will break out into smaller groups to take a deep dive into a particular farm business idea. Groups will develop asset maps for their idea and come up with feasible next steps to get started as a classroom community.

Activity 2 (20 min):

Option 1: Just Starting (Stage 1-2)

- Assign small groups of 2-4 students and hand each student a L8 Activity 2 Worksheet
- Read through the instructions as a class, pausing to address any questions about vocabulary.
- Have groups go through the first activity tasks, waiting until they've answered all the questions on the worksheet before giving students the Asset Mapping Template
- Next, have groups brainstorm what resources they can source from to begin their farmstand business idea. Using the asset map template:
    - Think about what physical items you can source for free from your environment, i.e. using tires as a mini garden bed, turning wooden pallets into garden beds or benches, or even using large bottles to create a garden wall.
    - What community relationships can you source from: Parents, community members, other farmers, etc. who may have specific skills? Evaluate ways that specific people or groups can support your project with the skills and resources they possess.

    - Think about what financial resources you can source: Grants, Fundraisers, Cookie Drives, Donations, etc. Have students think critically about the time frame for financial support and the best methods to implement based on their current resources.
- Have students share their group asset maps with the class and collectively explore the potential resources that may be available to them.

Option 2: Some Growing (Stage 3-4)

- Assign small groups of 2-4 students and hand each student a L8 Activity 2 Worksheet
- Read through the instructions as a class, pausing to address any questions about vocabulary.
- Identify what farm production method most matches your current growing situation (if you don't see it on the list, fill out under "other")
- Have groups go through the first activity tasks, waiting until they've answered all the questions on the worksheet before giving students the Asset Mapping Template
- Next, have groups brainstorm what resources they can source from to begin their farmstand business idea. Using the asset map template:
    - Think about what physical items you can source for free from your environment, i.e. using tires as a mini garden bed, turning wooden pallets into garden beds or benches, or even using large bottles to create a garden wall.
    - What community relationships can you source from: Parents, community members, other farmers, etc. who may have specific skills? Evaluate ways that specific people or groups can support your project with the skills and resources they currently possess.
    - Think about what financial resources you can source: Grants, Fundraisers, Cookie Drives, Donations, etc. Have students think critically about the time frame for financial support and the best methods to implement based on their current resources.
- Have students share their group asset maps with the class and collectively explore the potential resources that may be available to them.

Wrap-up & Reflection (5 min)

- Lead a large class discussion about what growing, and food access point options feel most doable for your school and classroom community.

ACTIVITY EXTENSION

L8 Activity 2 Extension

- Once you've landed on a production method and or food access point that feels right for your school community, create one large asset map as a class group. If time permits, discuss possibilities for envisioning a food access point for your site.

L8 Activity 2: Getting Started

Introduction
One of the important first steps in a farm business is assessing what people, tools, and resources already exist within your community. This is called asset mapping, and it's a valuable first step in considering how you will develop your farm business.

Let's Refresh!
Review the following activities and resources, or keep them on hand while completing this activity:

- Food System Exploration
- Feeding the Gap
- Urban Farm Research
- Urban Farm Design Lab
- Responding to Climate Change

Below you will find 3 different options for creating a food access point. These are real models that can be implemented at your school, should you choose to actualize your farmstand business. Review these definitions before you gets started on the activity!

Free Distribution	Donation-Based Sale	For-Pay Farmstand
Free distribution of food to school and/or surrounding community. This could take the form of a farmstand, as well as produce donations to the cafeteria, pantries, culinary programs, etc.	Donation-based, sliding scale, or pay what you wish. Customers are not required to pay, but the farmstand may suggest prices and is equipped to handle money transactions for those that do pay.	A farmstand with set prices. May be able to set up a sliding scale. The school can choose which forms of payment are accepted (ex: cash, check, credit/debit, etc.). In this model, the school can become qualified to accept food assistance benefits (ex: SNAP). The school can also become registered to accept and distribute Health Bucks.

Step 1: Circle **one** food production method and **one** food access point that you want to consider for this exploration. Feel free to mix and match, the possibilities are endless!

Note: If you are already growing with one of these methods (stage 3 or 4), highlight that one and pick a food access point to explore alongside it.

Food Production Methods:

Traditional Farming Aquaponic Farming Hydroponic Farming

Community Garden Rooftop Farming Other:

Food Access Models:

Free Distribution Donation-based Sale For-pay Farmstand

Other:

Step 2: Complete a big brainstorm with your group about what general materials, people, or resources you might need to support your project (consider what materials you would need for your farm *and* a food access point):

_____

_____

_____

_____

Step 3: Begin your asset map for your potential farm business using the template worksheet.

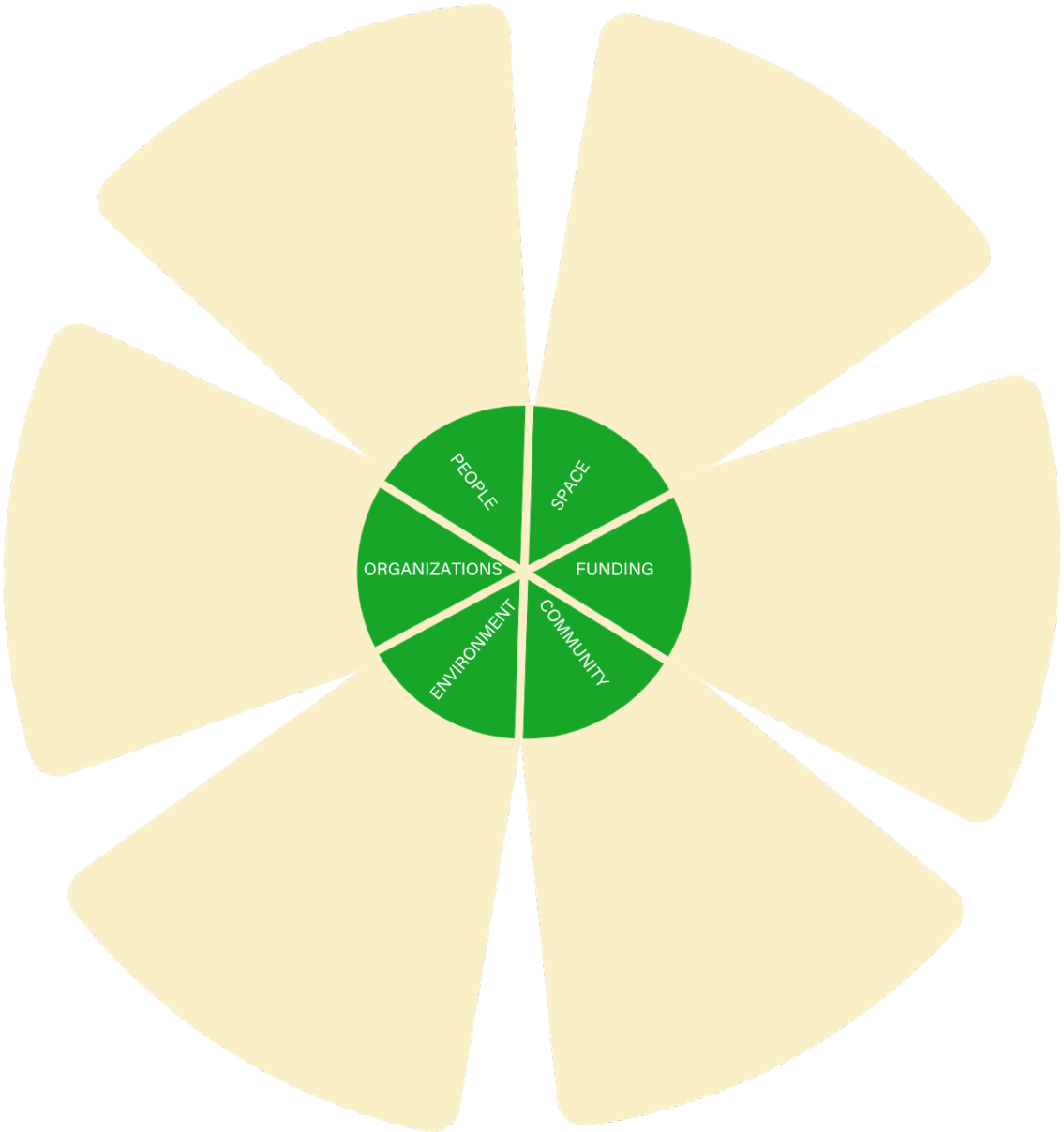
Name: _____ Date: _____

Asset Mapping Your Food Access Business

Introduction

Using the food production method and food access point you've chosen for this activity, fill out the asset map below. Each section of the map represents a different part of your community. Think about all of the resources you can source from to get started with your food access business

Food Production: _____ Food Access Model _____



Works Cited

[1] Wartman, Paul, et al. “Temperate Agroforestry: How Forest Garden Systems Combined with People-Based Ethics Can Transform Culture.” *Sustainability*, vol. 10, no. 7, 2018, p. 2246., https://doi.org/10.3390/su10072246.

[2] ETC Group. “Who Will Feed Us? The Peasant Food Web vs. the Industrial Food Chain.” *ETC Group,* 15 Oct. 2017, https://www.etcgroup.org/sites/www.etcgroup.org/files/files/etc-whowillfeedus-english-webshare.pdf.

[3] Carney, Judith A. *Black Rice: The African Origins of Rice Cultivation in the Americas*. Harvard University Press, 2009.

[4] “George Washington Carver.” *History.com*, A&E Television Networks, 27 Oct. 2009, https://www.history.com/topics/black-history/george-washington-carver.

[5] “Fannie Lou Hamer Founds Freedom Farm Cooperative.” *SNCC Digital Gateway*, 24 Sept. 2021, https://snccdigital.org/events/fannie-lou-hamer-founds-freedom-farm-cooperative/.

[6] Tabuchi, Hiroko, and Nadja Popovich. “Two Biden Priorities, Climate and Inequality, Meet on Black-Owned Farms.” *The New York Times*, The New York Times, 31 Jan. 2021, https://www.nytimes.com/2021/01/31/climate/black-farmers-discrimination-agriculture.html.