

Food Literacy in Massachusetts

Local Successes, Statewide Opportunities



In early 2016 stakeholder organizations that supported the creation of the Massachusetts Local Food Action Plan formed the Massachusetts Food System Collaborative. The Collaborative is dedicated to working toward an equitable, sustainable, and resilient food system in the Commonwealth, and helps build the capacity of food-system stakeholders to advocate for policy recommendations in the Plan.

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Executive Summary

To help Massachusetts children grow and lead healthy, independent, thoughtful lives, all students in grades K - 12 should have access to food system education in school, learning about agriculture, nutrition, food justice, and culinary skills. In doing so, they will learn critical life skills and will be better able to make decisions about food that are informed by an understanding of how those choices impact their body, their community, and the environment.

Many students throughout the state are already learning about the food system in science, social studies, wellness, culinary arts, horticulture class and others, as well as in the cafeteria, school garden, and the community. Since all students have a personal connection to food, these hands-on lessons resonate with them and allow them to deepen their understanding of core subjects. Students also learn essential skills such as how to prepare healthy meals for themselves. These lessons often incorporate discussions about inequitable access to food and the environmental impact of agriculture, providing students with opportunities to engage in making positive change in their community.

But not every student in Massachusetts has access to high-quality education about the food system. Because food literacy is not included in most state frameworks or tested by the MCAS, it can be challenging to include these concepts in the curriculum, particularly since many teachers are already overburdened by requirements. Teachers have reflected that they find it difficult to locate up-to-date and engaging lessons about food, and many feel they don't have enough of an understanding of the food system to offer lessons. Some of the strongest food lessons are interdisciplinary but teachers from different departments, and food service staff in particular, may have trouble coordinating lessons or finding the funding for the needed materials.



To ensure that all students have access to food system education, decision makers, school administrators, teachers, parents, and students should agree on the importance of teaching food literacy in schools, and collectively work to implement solutions. Food concepts should be included in the state standards, including those regarding health, social studies, and science. State agencies and nonprofit support organizations should share information, set goals around food literacy, identify program gaps, and create a central resource for lesson plans, professional development, and grants for educators teaching food literacy. To ensure that these programs are comprehensive and sustainable, coordinator positions should be funded at the state and district level.

Successful models of classroom food literacy work abound in Massachusetts. Building on those successes to ensure that all students graduate with an understanding of where their food comes from, how to feed themselves healthfully, and the role they can play in ensuring a sustainable and equitable food system can have a transformative impact not just on the students themselves, but on their families, their communities, and the Commonwealth as a whole.





The Importance of Food System Education

Understanding where food comes from, how to prepare healthy meals, and why not everyone has equal access to nutritious food is critical to enabling students to be independent, thoughtful, healthy community members.

In addition, there are many career opportunities in the food system, and students should be exposed to the variety of jobs that exist and begin to learn skills that are needed to succeed. This will help create a population of people who are more educated about the food system and more willing to advocate to support a stronger, more equitable, and more sustainable local food system. In a school context, food system education can be connected to virtually any other subject and is a great topic around which to do interdisciplinary and project-based learning. Though food system education is rarely required by federal, state, or district standards, and doesn't appear on standardized testing, these topics are critical to a well-rounded education.

The Massachusetts Food System Collaborative is working to understand and expand food system education in K - 12 schools in Massachusetts. The Collaborative was created following the completion of the [Massachusetts Local Food Action Plan](#) in December 2015. The goals of the Collaborative are to promote, monitor, and facilitate implementation of the Plan. There are several recommendations in the Plan that support increasing food system education in K - 12 schools:

- [Food Access, Security and Health 4.1.1](#) Re-introduce contemporary home economics curricula to public middle and high schools. Contemporary home economics classes could involve an integrated curriculum including basic cooking techniques, MyPlate education, local agriculture education, food budget principles, food safety, nutrient information and labeling, and food-related health benefits and risks.
- [Food Access, Security and Health 4.1.2](#) Encourage and support nutrition education that is age-appropriate for students in elementary schools.
- [Workforce Development and Training 1.7.4](#) Support the development of curricular connections between school gardening programming, farm to institution food service relationships, and job and career information for students at elementary and secondary levels.

Many Massachusetts students are already participating in creative, hands-on, curriculum-aligned food system education. Over the past year, we have conducted dozens of interviews with school- and nonprofit-based educators across the state. We learned about the many ways teachers and administrators have integrated food literacy into their schools and what students have gained from these lessons. We heard about the components that have made their programs successful, and could help others to start food system education at their schools. And we heard about the challenges to implementing these programs and what funding, support, and policy changes at the state and local level would enable their programs to thrive and other schools to offer similar programs.

We spoke with MA agencies and related stakeholder organizations about how they are helping schools and teachers to implement these lessons. And we heard from other states about additional approaches to expanding food system education.

Food system education is broad and includes many topics and subjects. Food literacy includes an understanding of how food is produced and consumed and the impact those processes have on the environment, the community, and individuals. There are many measurable and intangible impacts that these lessons can have on student knowledge and behavior. Much research and writing on this subject has already happened, bringing to light evidence of the benefits of students learning about agriculture, nutrition, and food justice.

Agricultural education

When students learn how their food was grown, harvested, processed, and transported they begin to appreciate the importance of agriculture, how much work is involved, and how the community can support local agricultural producers. Students also begin to think about how their food choices impact the environment.

There has been growing awareness over the past several decades that students need to learn more about science, technology, engineering, and math (STEM) to meet the needs of the future labor market. Food studies are a natural way to tie together many STEM topics to something that is relevant and interesting to many students ([Wang](#)). Learning to cook, garden, and read nutrition labels can make science and math lessons tangible and useful. Many studies have shown that food-based lessons increase students' knowledge of science ([Hovland](#)) and math concepts ([Hyman](#), [James](#)). These lessons can be tailored to students at all ages ([Schmidt](#)) and may have a significant impact on the learning of Black and Latinx children ([Sprague](#)).

Farming and food production are linked to the natural environment. By studying how fruits and vegetables grow, students learn important biology lessons while also developing an appreciation for the natural environment and the importance of environmental sustainability ([Skelly](#), [Wells](#)). Many schools teach agriculture through school gardens. Research has found that adults can be inspired to protect the environment by spending time in nature as a child. Outdoor classrooms such as school gardens provide a connection to nature that is beneficial to many students' learning ([Chawla](#), [Wells](#)).

Ag education introduces students to food system careers, which are varied and in demand. To have a strong local food system, Massachusetts needs people with the skills to grow, process, transport, and sell food. According to the [USDA](#), in 2020, around 10 percent of jobs in the US were in agriculture, food and related industries.

Nutrition education and culinary skills

Students should be familiar with common foods, including local produce, and they should learn how to prepare healthy food for themselves. Most children and young adults in the US are not eating a healthy diet, leading to increasing rates of obesity and obesity-related diseases in children and putting them on the path to face challenges later in life ([Moore](#), [Kelder](#)). And due to ongoing inequities, children of color have a higher prevalence of obesity than white children: 24% of black children, 26% of Hispanic children, and 16% of white children are obese ([Fryar](#)). Reaching students when they are young with accurate

information on how to enjoy healthy food and helping them to develop an appreciation for fruits, vegetables and whole grains, may help students to be healthier ([Howerton](#), [Scherr](#), [Evans](#), [da Silveira](#)). Currently, however, students nationally receive less than 8 hours of nutrition education each year ([CDC](#)) and as of 2014, only 35% of school districts require a school nutrition education curriculum for each grade level ([Bridging the Gap](#)).

Food justice

Food justice is the concept that everyone should have access to healthy food and that everyone involved in the production and distribution of the food should be treated fairly. Students should have the opportunity to think critically about food access in their own schools and communities. Students should learn how racist policies in the past created the nation's agricultural system and how systemic racism continues to perpetuate an inequitable food system, including inequalities in land access, food access, and environmental justice. Learning about the prices of healthy and unhealthy food, and its availability or lack of availability in different neighborhoods, will help to reveal inequities in students' communities, which many students experience firsthand ([Feeding America](#)). Students should also learn how food is integral to cultural identity, including how people shop for food and cook, what foods they eat, and how they celebrate holidays.

When learning about the injustices that exist in the food system, students should also learn what they can do to address those problems and many food related lessons help students to engage in making change in their community. This type of hands-on advocacy has been shown to prepare students to participate in the policymaking process more than when they simply learn about the process ([Gray](#)). Along with teaching important concepts and skills, some youth groups advocating for food justice have had tangible policy successes ([Jablou](#)).

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“By teaching a food literacy approach, we can move away from a stigmatizing, paternalistic method of teaching nutrition and addressing obesity. Food literacy can be culturally responsive, asset based, solution-oriented. It weaves together health, the environment, and social justice.”
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The Current Status of Food System Education in Massachusetts

Dozens of local efforts across Massachusetts help educate students about the food system. Over the past year we have interviewed many school-based and nonprofit educators about how they integrate food system topics into their classes. We learned about what types of classes cover which food system topics, and how teachers connect them to the required classroom standards. Teachers told us about why they integrated food system education into their lessons, and how their students benefited. We learned about the collaborations and lessons and materials, among other things, that have helped to make these programs successful. And we learned about how lack of time and funding and education and other factors still make it difficult to integrate these lessons into the school day.

Successes

High quality academics

Food system education is being creatively integrated into classrooms, the cafeteria, and the school garden. Students are able to make connections between concepts they are learning in their social studies, science, math, and English classes and food, in interesting and vivid ways.

Inclusive teaching

Students who might not thrive in traditional classroom settings or in standard academic subjects can flourish when learning in a school garden, or sharing their families' culinary traditions. Some student families who are less connected to the school due to a difference in background or language skills may also have strong agricultural or culinary backgrounds and be more likely to engage with the school around their food literacy programming. There are many effective special ed programs that incorporate food, providing essential skills and career readiness training including those in Amherst, Boston, and Somerville.

Engaging lessons

Students are excited to learn about food because it is relevant and personal. "Students are hands-down most interested and engaged when they get to eat food," said one teacher. "Having students try to trace back, or at least think through, where the food they are eating came from and the steps it took to get there sometimes works. An example: plant kale, tend to it, harvest it, cook kale chips, eat it. Students are second most excited to talk about themselves - what they eat, like/don't like, family traditions and culture around food, favorite recipes, etc."

Life skills

Students' food attitudes and behavior are positively impacted when they are able to grow food, prepare it, and taste it. Many students learn about cooking healthy foods and then bring this knowledge home to their families. By learning to choose and prepare healthy foods for themselves, students are acquiring skills that they can use for the rest of their lives. One teacher said, "I want to ensure that my students are ready to make healthy choices when they leave high school."

Community leadership

Through learning about food justice, students are more aware of historic and ongoing inequities in the food system and feel empowered to make improvements in their community. When students learn about agriculture and the food supply chain, they understand the labor, water, and resources that go into creating the food that they eat. This can help them to make more informed decisions and understand the impact that their food choices have on the environment. One educator wrote, "Food system literacy helps to build the knowledge and skills of young people to co-create solutions to tackle the most important and impactful issues we face: climate change, hunger, land loss and degradation, and racial inequality."

Components of successful food system education

Since most schools do not offer food system education, and since it is not typically included in standards or testing, it takes significant effort to create an effective food literacy program. Educators mentioned a number of elements that were critical to enabling them to implement their food education programs.

Administrative buy in

School administrators who believe in food system education can make it much easier to start a new program. They can set aside time for collaboration between staff members, and dedicate resources to a program. They can create partnerships between schools and elevate the importance of food system education throughout the school. Administrators in Lowell and at the Diman Regional Vocational Technical High School helped to forge creative partnerships.

Food literacy champion

Having a champion at the school, such as an administrator or teacher, is critical to beginning and sustaining a program. These leaders often believe in the importance of nutrition and agriculture education and may have experience in gardens or kitchens. They often work to acquire infrastructure, identify appropriate lessons, and bring people together to start the project. Key figures in Salem and Boston have helped to introduce more robust school garden programming.

Food literacy team

Though having a leader spearheading the project is important, relying on one person's time and energy is often unsustainable. If they leave their role or have a change in responsibility, they may no longer be able to coordinate the program. And people may just burn out. Having a paid coordinator and a team of people who are dedicated to food system education helps to create a sustainable program. Some schools enroll teams in farm to school institutes which help the educators learn more about food system educa-

tion and get support to design an implementation plan for their school or district. Northampton and many other districts have created teams.

Paid school garden or farm to school coordinator

Sometimes having a team of people each dedicating some of their time to the effort is not enough. A funded position dedicated to coordinating school garden or farm to school activities can be important to creating efficient programs. School gardens - like all gardens - require an initial investment as well as ongoing maintenance. If various teachers are going to be using the garden, there needs to be coordination about when and how various groups will use the garden space. Farm to school coordinators are also valuable and can help to coordinate classroom and cafeteria activities around healthy, local food. The coordinators can help organize a cohesive curriculum, apply for grants to support the activities, and deliver some of the food literacy lessons. There are many examples of districts with school garden coordinator or farm to school coordinator positions, including Amherst, Chicopee, Salem, and Springfield.

Interdisciplinary coordination

As many of these programs rely on coordination between teachers in various departments, or between classroom and cafeteria staff, or between teachers and an outside organization, having the paid time to make and sustain those necessary connections is critical. Collaboration between different departments has led to interesting programs in Cambridge, Northampton, and Salem.

Connection between the classroom and the cafeteria

There is the potential for cafeteria staff to help teach students about nutritious food, the source of their food, and culinary skills. These partnerships can be very engaging - students learning to cook a certain recipe then find that it is on the school lunch menu while other students read books that highlight foods served in the cafeteria, for example. Developing relationships among staff can also help bridge the classroom-cafeteria divide. See below for examples of these connections in Cambridge, Lowell, Northampton, and Salem.



Funding for materials

Cutting boards, knives, blenders, pots, and hot plates are important tools for teaching basic cooking skills and gardens also require an initial - and ongoing - investment. Innovation Academy Charter School, Norwell Public School, and others are able to do hands-on projects due to access to cooking materials and supplies.

Professional development opportunities

Teachers must be dedicated, creative, and knowledgeable to implement new food system lessons. Many teachers bring their own expertise and interest to the classrooms and encouraging teachers to bring this energy is critical. Teachers who are interested in learning more about the food system can participate in professional development opportunities to build their capacity. Some local organizations that offer food system PD are listed in the appendix.

Partnerships with nonprofit organizations

There are many nonprofit organizations in Massachusetts that work to provide food system education to students. They may focus on nutrition, school gardens, food justice, or on-farm education. These organizations are important resources for schools as they can provide in-depth knowledge and tested lessons. Many programs have experienced educators who go into classrooms to provide structured lessons while others offer professional development and lesson plans so teachers are able to implement the lessons themselves. Many programs work with schools and teachers to design a curriculum that fits with their existing lessons. Some of the programs are provided at no cost while others are provided at lower cost and are supported with grants. More information about several nonprofit organizations are listed below.

Strong school wellness policies

Strong local school wellness policies can provide justification for food system education, as well as buy-in from a variety of members. Every school district that participates in the national school meals program must have a publicly available local wellness policy and it must include goals around several topics including nutrition education. There must also be a wellness committee that includes representatives from different parts of the school and community. This group, and these policies, can provide an important statement of the importance of nutrition education. Examples of schools with strong wellness policies include Salem and Cambridge.

Ongoing challenges

Data from recent national surveys underscore many of the challenges that educators mentioned during interviews. According to the CDC's [School Health Profiles 2018: Characteristics of Health Programs Among Secondary Schools](#), only 36% of MA schools taught all 22 nutrition and dietary behaviors topics. The 2019 USDA Farm to School Census, which received responses from 308 out of 448 MA School Food Authorities (SFAs), found that 65% of responding SFAs participated in farm to school education and only 15% integrated a school garden into the curriculum ([Bobronnikov](#)). There is room for improvement.

Constraints of the school day

It is difficult for teachers to add lessons about food which are not part of the standards as the required topics already fill their available time. The Department of Elementary and Secondary Education provides frameworks for various subjects which help guide curricula and lesson plans from pre-kindergarten to grade 12. Aside from the [Comprehensive Health Framework](#), which is currently under revision, and select clusters of the [Vocational Technical Education Frameworks](#), food is not a focus of study within the frameworks. Other relevant frameworks include: [Science and Technology / Engineering](#), [History and Social](#)

[Science Framework](#), [English Language Arts and Literacy](#), and [Mathematics](#). In addition, most students in grade 3-8 and grade 10, take the Massachusetts Comprehensive Assessment System (MCAS) and topics tested include English, math, and science, technology, and engineering. Food literacy is not tested.

Complexities of coordination

Creating a food system education program can be difficult as the topic might engage multiple subjects, including social studies, science, wellness, and career skills. Coordinating between disciplines at the older grades can be effective but is also difficult to organize and lead. Because of school schedules, it can be difficult for teachers from different departments to find common planning time.

Because food service departments are often funded and managed separately from the rest of the school, it can be hard to create connections between food service staff and classroom teachers. The [CDC](#) found that only 40% of MA health education staff regularly collaborated with food service staff. It may also be difficult to raise funds to pay cafeteria staff to spend time doing additional educational activities.

Availability of high quality lessons

Teachers who want to implement new food system lessons often don't know where to go for high quality, up-to-date lessons.

Teacher preparedness

Food system education is rarely taught to people studying to become teachers so teachers may not feel prepared to teach these concepts. In the two years before the [CDC survey](#), only 32% of the lead wellness teachers received professional development in nutrition and dietary behaviors, however, 72% of lead wellness teachers were interested in doing professional development on those topics.

Insufficient funding

Materials to support food system education, such as cooking equipment, food, and school garden materials are often not included in a school budget. Teachers must fundraise to support these programs but many don't have time to look for grants or the skills to apply. One teacher said, "We have a small ~2 acre garden with hardly any infrastructure or financial backing. We've been trying to get grants for funding not only the garden, but infrastructure, student summer positions, and a garden management position... We don't have a grant writer and that falls on the teachers to write grants. Most of us aren't proficient in this or have enough time."

Inequitable access

Students in different schools - sometimes even within the same district - are getting very different exposure to food system education. In some districts, food system education takes place only in elementary school, while others include these lessons only in high school. Many demographic factors impact whether schools have food literacy programs, and those that do exist are inconsistent and tend to be driven by available resources. Better resourced schools may have more access to school gardens and kitchen labs; only low income schools qualify for traditional SNAP-Ed programming; communities where there has been ongoing support for food education are more likely to have school gardens; and urban schools are more able to partner with urban ag nonprofits.

Perceived lack of interest

If high school students are not aware of the type and number of food system careers that are available, they may be less likely to take relevant vocational technical education courses. As a result, schools may reduce the number of courses that adequately prepare students for food system careers, and vocational schools that teach these essential workforce skills won't receive the resources they need.

Wellness policies weaknesses

Local school wellness policies are required but often don't include all of the required elements. Even when they do, they may not include specific requirements around nutrition education or implementation plans. Only 76 of 308 SFAs in Massachusetts indicated that they had wellness policies in support of farm to school activities and 79 SFAs indicated that they had no policies in support of farm to school activities ([Bobronnikov](#)). And the [CDC](#) found that only 60% of MA health education staff worked with a school wellness committee.

Waitlists for vocational technical schools

There are two general types of vocational technical education programs in Massachusetts. One type meets the definition of vocational technical education in Massachusetts General Law Chapter 74, and is approved by the Department of Elementary and Secondary Education. The Chapter 74 program for agriculture is under the agriculture and natural resources cluster and there are four frameworks: agricultural mechanics (which also includes land and water management), environmental science and technology, horticulture, and animal science. Chapter 74 agricultural programs are available at the four state agricultural high schools: Bristol County Agricultural High School, Norfolk County Agricultural School, Essex North Shore Agricultural and Technical School, and Smith Vocational and Agricultural High School.

There are also Non-Chapter 74 career and technical education programs, which may be offered at traditional high schools. Horticulture is taught in a number of schools; three high schools offer family and consumer science; and almost 70 schools offer a culinary arts program, some of which are Chapter 74-approved.

Many vocational schools have long waitlists, meaning that students who are interested in taking agricultural courses may not be able to.



Examples of food system education in Massachusetts schools

Throughout Massachusetts, students are learning about growing food, how to cook healthy dishes, and how food connects them to their culture and community. They are being given the opportunity to make thoughtful decisions about food, to patiently wait for plants to grow, and to make change in their communities. These lessons are part of their science, social studies, English, and art classes, and their classroom learning is often supported by the food and activities in their cafeteria. After interviewing dozens of teachers throughout the state it is clear that many students are participating in creative food system education. These examples are not a comprehensive list of food education in the state, but are representative of some of the opportunities that should be made available to all Massachusetts students.

Amherst Public Schools

Science and Garden Coordinator and Garden Educator positions and full year course

The Amherst Public School district has a [Science and Garden Coordinator and a Garden Educator](#). The two educators have written a curriculum that connects hands-on garden activities to the Science and Technology/Engineering Framework and this garden-based curriculum is now a formally recognized part of the elementary curriculum. One of the educators visits each classroom 5 - 8 times per school year to provide the lessons, both in the gardens - the three elementary schools in the district each have more than 15 raised garden beds - and in the classroom. In addition, the educators help teachers implement garden-based lessons, organize field trips to a local farm, and connect with the school nutrition department to incorporate garden produce in school meals.

The program is partly funded by grants from local nonprofits, as well as the Whole Kids Foundation and the USDA. With district budget constraints a perpetual challenge, the program works hard to collect quantitative data - including how many students participate, how much time students spend on these lessons, and how many pounds of food are grown in the school garden - as well as feedback from teachers, parents or guardians, students, and other community members on the value of this program. According to the coordinator, "Collecting quantitative data for garden program impacts can be very challenging... That said, we can tell you what we see when students are learning in the garden spaces: they are happy, engaged, observing closely, communicating with peers, sharing their ideas, expressing enthusiasm, asking questions, and trying new foods, flavors, and textures. Those all feel like successes!"

They continue to think about ways to make the program sustainable, including the possible addition of another part time educator, training the kindergarten through 2nd grade teachers to be able to provide some of the lessons themselves, and creating a school garden support team.

At the alternative program for students with moderate disabilities at the high school, juniors are able to take a semester-long course on food. When the teacher first began teaching the class, many of the lessons were prescriptive with negative messages such as ‘the food system is bad for the environment’ and ‘these foods are bad for your body.’ She started searching for a way to instead celebrate food and how important it is to personal identity, history, and community. After taking a week-long course for teachers at Stone Barn Farms, she implemented their curriculum which enabled the students to explore cuisines from around the world, including trying crickets from Oaxaca and cooking a traditional Gullah sea island red pea dish to celebrate the new year. Every week has a theme, with an open-ended writing prompt and a cooking project. Students have enjoyed bringing in family recipes to share with the class and learning that they all have different cooking skills to offer to the group.

Boston Green Academy

Hydroponic growing

The Boston Green Academy is a charter school for 6th - 12th grade students in Boston with a focus on sustainability. The high school includes a Chapter 74 program in [environmental science](#) and as part of that, students manage planting, maintenance, and harvesting greens in the Freight Farm - a vertical, hydroponic garden that is equivalent to four acres of land. Due to regulations, it has been difficult to serve the food in the cafeteria and because of the high energy consumption of the farm, the school is considering connecting the farm to solar panels.

In addition, all students do a week-long project in the spring and a four to six week internship as seniors, both of which can include a focus on food system issues and careers.

Boston Public Schools

Outdoor classrooms and school gardens

Of the 121 schools that make up [Boston Public Schools](#) (BPS), 40 have outdoor classrooms, thanks to the [Boston Schoolyard Initiative](#). BPS also has 64 active school gardens and two Freight Farms. The outdoor classrooms and gardens have proved useful for science, social-emotional learning, physical education, English language arts, art, and special education classes. Food system education can start early. In one kindergarten class, students learn about butterflies and other pollinators, do vermiculture in the classroom, sprout seeds inside, and help to maintain sensory raised beds that contain herbs the students can touch and smell.

Currently, 24 of the gardens are managed by City Sprouts or Green City Growers. These external partners provide maintenance and on-site education in collaboration with classroom teachers. Other school gardens are managed by teacher champions or parent volunteers, or by partners such as Eastie Farms, Haley House, and FoodCorps. The volunteers help coordinate various classes using the space, advocate for needed materials and maintenance, fundraise, and coordinate volunteer clean up days. School gardens have brought people together who normally don’t work together including the facilities department, teachers, businesses, principals, and nonprofits. In addition, the food service department has been working on several projects to connect local farmers to the cafeteria, and to connect elementary classrooms to education around food.

The district is currently hiring an outdoor teaching and learning manager who will report to facilities management and the science department. They will help maintain existing outdoor learning spaces, including

gardens, and help to start new spaces. They will work with programs that implement education as well as provide direct instruction. In addition, both departments have been applying for funding to support more outdoor learning through funding maintenance, partnerships, and teacher professional development and champion stipends. BPS recently approved \$3 million in FY23-FY24 Elementary and Secondary School Emergency Relief Fund funding for these outdoor teaching and learning priorities.

Cambridge Public Schools

Community collaborations

Several organizations and groups of people work to support food system education at Cambridge Public Schools. During school nutrition week, school librarians circulate a list of books that connect to the menus that are being served and also offer cooking demonstrations in the library.

A mini grant has funded a program in which health educators work with City Sprouts to grow food in school gardens with students in 2nd through 4th grade. The health teachers then use cooking carts to give demonstrations on how to prepare the items.



The food service department is well connected to other educators at the school as well as to parents and the community. The department has a communications specialist who provides outreach to teachers and staff and parents about school meals, including taste tests, new dishes, local food, etc. The nutritionist at the city's public health department supports the food service department by working with the communications specialist to offer cafeteria taste tests and create and send out Harvest of the Month newsletters to parents, teachers, and community organizations. Harvest of the Month is a program that

highlights one local product each month; Mass Farm to School provides posters, recipes, and lessons about each product.

The Wellness Committee is led by the city's public health department and a school staff person. They have both a [traditional wellness policy](#) as well as a more specific [implementation guide](#) which outlines how to implement the policy. The guide includes the requirement that the school have a Food Service Advisory Committee to enable parents and food service staff to collaborate on improving the meals that are served in school.

Chicopee Public Schools

Farm to School Coordinator position

The [Chicopee Public Schools Food Service Department](#) has a farm to school coordinator who orders local food, facilitates partnerships within the school district and in the community, manages social media communication, and writes grants to fund programming. The purpose of this position, which was initially funded by the Henry P. Kendall Foundation and is now funded by the school district, is to bring healthier,

local foods into the schools, educate students about the importance of eating local food, and create excitement around school meals as a way to increase school meal participation. Special events have included an apple crunch day, salad days, after school cooking clubs, cooking nights at school, and food events at the Chicopee Public Library. This position has been critical to forming partnerships and ensuring that students are excited to learn about food throughout their day. Said the original coordinator, “We don’t do any hard data collection, but we find that students become more open to trying new foods, especially when they grow and prepare them.”

The district has also been focused on integrating more local seafood; they have taken the “Local Seafood Pledge” to increase the procurement of seafood from the Gulf of Maine over the course of the year with the goal to put local seafood on the menu at least five times throughout the year. This has included local kelp smoothies with kelp from Atlantic Sea Farms, “Sole-O” Buffalo Fish Nuggets from Northcoast Seafood, and local haddock sticks from Red’s Best. They are planning an education event with a local fisherman for May to coincide with seafood as Mass Farm to School’s Harvest of the Month.

Dennis-Yarmouth School District

Horticulture course

Horticulture classes are offered as an elective at the Dennis-Yarmouth Regional High School. The school has a small greenhouse where students grow food for cooking lessons in elementary school health classes and for the cafeteria. They also learn to design science experiments by measuring the growth of plants that are fed different substances, including more acidic water, saltier water, coffee, and insulin. These experiments often lead to discussions about climate change and the impact of changing weather patterns on farming. Elementary students often help plant the seeds, and high school students with special needs also help in the greenhouse. The program is funded by plant sales and grants.

Diman Regional Vocational Technical High School, Fall River

Aquaponics partnership

The culinary department at the [Diman Voc-Tech School](#) collaborated with the natural sciences department at Bristol County Agricultural High School around an aquaponics project after administrators from both schools took a course together. The students at Bristol Aggie implemented an aquaponics system to raise around 200 tilapia. The ag students showed the culinary students how the fish were grown and how to track their growth. When the fish were market weight, the two groups of students learned to filet the fish and the culinary students demonstrated how to prepare the fish. This partnership enabled students at both schools to experience the full life cycle of the fish, learn how to prepare fish, and further understand where their food comes from.

Four Rivers Charter School, Greenfield

Environmental science course

At Four Rivers Charter Public School in Greenfield, all high school students take an Environmental Science class as ninth graders. The first semester of this class focuses on food justice and climate justice and the second semester focuses on ecology and watersheds. In this class, students visit local farms and interview local farmers. They learn about food systems and food justice and complete service work by gleaning produce at a local farm and donating it to a local food bank. They also work in the school garden and conduct a lab that looks at herbivorous insect predation on kale plants. The book [A People’s Curriculum](#)

[for the Earth](#) has been a resource for lesson plans. This course incorporates standards from earth science, biology, and ecology. Four Rivers students then take biology, and the biology MCAS, as 10th graders.

Four Rivers also offers a Nature Class which focuses on permaculture gardening, wildcrafting, foraging, and wilderness cooking. They also have three day intensive classes on topics such as Hispanic/Latinx cooking, bread baking, wilderness cooking, medicinal plants, and local food and farming.

Hawlemont Regional Elementary School, Charlemont

Agriculture elective

The Hawlemont Regional Elementary School has a focus on agriculture and the campus includes a barn with farm animals, a greenhouse, and many raised beds. Each student participates in the [Hawlemont, Agriculture, and You](#) (HAY) program once a week. During the HAY class, students take care of the animals, grow food, cook with the harvest, and weave with wool from the animals, and these activities often connect to what the students are learning in the classroom.

When students were studying ancient Egypt, the class learned about ancient farming tools and even tried to make food based on ancient recipes. Third graders studying local indigenous tribes learned about their maple sugaring practices and recipes. When studying area in math, students calculated the area of the barn and how many hay bales could fit in the building. Humans' impact on the environment and the impacts of agriculture and water use are also covered. The HAY teacher reports that, "The grade-level classes also integrate HAY learning in their classrooms so students are handling real world problems that impact their daily life in all aspects of school."

There is significant social emotional learning that is taking place as students work on group projects and as they care for plants and animals. Students learn to treat the animals with compassion and to notice how they are feeling. Because growing vegetables takes time, students develop long term planning and patience.

The program continues to offer professional development so teachers feel comfortable in the garden and able to make connections between the food program and their own work. This program is funded by fundraising events such as a plant sale, farmers market, and cider day, as well as grants and donations.

Innovation Academy Charter School, Tyngsborough

Sustainable Food Systems course

At the Innovation Academy Charter School in Tyngsborough, juniors and seniors must take a lab science class. They can choose from chemistry, physics, or a new course called sustainable food systems. This course combines the history of the food system, culinary history and skills, sustainability, plant science, and food science. The course begins with students mapping their personal food systems. They then focus on indigenous foodways and growing traditions, land removal, and the domestication of crops. During that unit, they make a three sisters succotash, sample foods from indigenous run businesses, including an oyster farm and restaurant, and research indigenous people and organizations working on food issues.

The next unit focuses on the African diaspora and the impact on US history and cuisine, including African-American contributions to farming techniques, the beginnings of CSAs and free lunches, as well as inequities in land ownership due to redlining and other racist policies. As part of this unit they cook black pea fritters. The class then focuses on the transition to industrial agriculture, as well as some responses

including small-scale and diversified farming. They learn about food waste by doing food waste audits, talk about the impact of biotech on food while sampling meat alternatives, and study food taboos while making dishes from crickets. They study food policy by learning about inequities in the food system and proposing solutions.

The second semester focused on growing plants. They discuss seed diversity and culturally relevant crops before selecting what to plant in their school garden. They then tend to the plants to prepare them for the school's plant sale during which time they learn about plant science. While studying food science, they experience fermentation and enzyme reactions through baking bread and making cheese.

The class has access to cooking equipment, which was funded through a grant from the state, and a greenhouse. The teacher was able to participate in extensive professional development to learn more about the issues and design the curriculum, including taking courses with Stone Barn Farms, Pilot Light Chefs, Edible Schoolyard, and Mill City Grows.

Lowell High School

Regional and international cuisine electives and a cookbook project

The culinary arts program at Lowell High School offers opportunities for students looking for the skills needed to pursue a career in food service following high school and students who are planning to go to college and would like to know more about food and the restaurant industry. Food Studies courses offered include: the science of cooking, nutrition and dietary choices, regional cuisine, and international foods. In these courses, students discuss food justice and food insecurity, global supply chains, labor issues, and local agriculture paired with field trips to farms, historic cooking sites, and maple sugaring operations. The culinary arts courses, which are offered at three skill levels, operate out of the school's Courtyard Restaurant and expose students to a small restaurant's daily operations, including the hot foods kitchen, bake shop, customer service, and sanitation. The Culinary Arts Club that meets after school introduces students to opportunities available within the school.



There is the opportunity for these programs to collaborate with other subjects, such as science or environmental studies, as the school's new facility will include a rooftop garden and hydroponic growing facility. However, it can be hard at such a large school to coordinate with teachers in other subjects.

Based on the large and increasing numbers of students who sign up for these courses, there is a growing interest in food at the high school, however many students begin the class with minimal cooking skills, in part due to a lack of education in these areas in the lower grades.

This program is currently funded through grants, restaurant sales, and a stipend budget. The culinary

program is planning to transition to a Chapter 74 program to receive more funding from the Carl D. Perkins Career and Technical Education Act, a federal law which provides funding for career and technical education.

Also at Lowell Public High School is a U.S. history and civics class for recent immigrants and refugees who are learning English. After studying about immigration in the past, they connect those learnings to their own experiences through writing a cookbook. Each student is asked to learn the recipe for a favorite family dish. This requires them to connect with family members, think about the context in which the food was prepared, and reflect on how they have carried their food traditions to their new home. The students then practice their English in writing clear recipes and narrative stories that explain the background of the dish and a little bit of their migration story. Together they create a cookbook called [Tasting History](#) and celebrate by bringing dishes from their home countries to school so their classmates can taste them. The cookbook is then shared widely in the community. Last year's cookbook was awarded the regional [2021 Founders Award by Readable Feast](#). This year the district's food service department is also cooking from their cookbook by including one dish a month on the menu. Cambodian beef lok lak was served in January.

Next Wave / Full Circle, Somerville *Project-based food course*

Next Wave / Full Circle is an alternative middle and high school in Somerville that has transitioned to offering short, intensive, project-based courses on science and social studies related topics. One project-based high school course is called Citizen Food and has included growing food in raised beds, taking field trips to urban farms, and discussing concepts around where food comes from and how it was grown,

harvested, and transported. Many of the projects are based on student interests - one student whose family was from El Salvador studied pupusas, corn, and monocropping, while another student who was interested in animals studied the humane treatment of livestock.

The course was created by Springpoint Schools and paid for by a grant. Unfortunately, the program recently moved to a new building that doesn't currently have raised beds.

Norfolk County Agricultural High School, Walpole *Maintain a garden, farm, orchard, and livestock*

The plant science teacher and the environmental science teacher at Norfolk Aggie led a group of teachers and students to create the [Aggie Abundance Garden](#) during the pandemic. The harvest is donated to four local food pantries and has helped to feed more than 10,000 people. The newly formed Farm to School



Club has participated and alumni, local businesses, and community members have donated time, money, and equipment to support the garden. In addition, the school has an apple orchard, an American chestnut orchard, beehives, pigs, and cattle, and they hope to bring back laying hens.

The teachers would like to see the farm expanded from 1.5 acres to more than 4 acres so students and others could see a modern, intensive, sustainable farm in action. "This has always been part of the curriculum but we want to make sure that if a student wants to be a farmer, they can learn what they need to know here," said one teacher.

To do this sustainably, the school would need additional funding for a paid farm manager and to provide stipends to students to work on the farm during the school year and over the summer. The farm currently uses outdated equipment and is without irrigation. They have applied to several grants from local and national foundations; so far they have received one small grant which enabled them to plant perennial crops such as asparagus and rhubarb. The teachers have limited time to apply for grants so they are hopeful that the new administrators might hire a farm manager.

Northampton Public Schools

Cafeteria to Classroom connection

The food service director at Northampton Public Schools has created many partnerships to help expand food system education in the district. She has coordinated with Grow Food Northampton (see below) cooking lessons by offering a similar dish in the cafeteria to what the students are making in their classroom, such as a hummus apple wrap. If it is popular, she then adds it to the weekly menu.

There will soon be a composting program at the high school cafeteria and she engaged students in the environmental and honor groups to help design the program and educate their peers. During the pandemic, she worked with high school volunteers who helped pack boxes of food and learned about the school meal program.

The community has been very supportive of farm to school activities. The district created a team that included a superintendent, two science teachers, the food service director, and a school committee member which attended the Farm to School Institute. For two days they learned about various ways to implement these programs and created an implementation plan for their district. The superintendent also attends wellness committee meetings and their local representative is supportive of their efforts as well. In late 2021, the district hired their first farm to school coordinator.

Norwell Public Schools

Food truck project

At the middle school, food and nutrition is an exploratory class - like art and STEM - and students take it for part of the year. During that time they learn about nutrition, as well as communication skills, career options, and financial literacy. Guidance counselors help teach a few classes as a way to support learning and make more connections with the students. In 8th grade, students use these skills on a project to develop a food truck business plan, including menu planning, recipe testing in the kitchen classroom, market analysis, and a final food truck recipe face off. The teacher mentioned that there is a lot of misinformation about nutrition online so teaching students accurate and positive nutrition information is important, however it can be difficult to find up-to-date nutrition lessons.

The principal and superintendent have been very supportive of the [family and consumer science curriculum](#) at the middle school. The teacher shared that the students really enjoy the days they are able to cook in the classroom and parents have appreciated that when their children are enrolled in the class, they become more involved in cooking at home and the whole family eats better.

Salem Public Schools

Agricultural Specialist Teacher, Food Photo Project, Cafeteria to Classroom connection, and Agriculture lessons

Salem Public Schools has a STEM specialist teacher at one elementary school who focuses on teaching agriculture and making connections to the school gardens through the STEM lens. Students are able to take the class once a week as a special, much like art and music. The STEM class provides hands-on experiences to support learning that is happening elsewhere. For example, cooking projects, such as bread baking, incorporate science principles, while calculating how much compost is needed for the gardens builds on fifth grade math standards. “Students enjoy working hands-on in the garden and being able to do special projects like the bread baking,” said one teacher. “Some students have not had opportunities to engage in these activities before, and they provide rich learning and life experiences for students.”

Along with a dedicated classroom, the teacher makes use of the courtyard garden, 30 raised beds, and a greenhouse. Students also make several visits to Appleton Farms, a historic working farm. The educator, who has led school garden efforts at the school for ten years and has a culinary background, also leads the farm to school team and provides professional development for other teachers. She coordinates

with the cafeteria and leads taste tests that align with the Harvest of the Month. There is currently advocacy to fund a farm to school coordinator position to support food literacy throughout the district.

Another project at Salem Public Schools paired sociology students at Salem State University with third-grade students at the Horace Mann Laboratory School to explore food justice using a participatory research method called photovoice. The project involved the younger students taking photos that reflected their experiences with food, culture, and community. The work was tied to the English language arts curriculum, as both groups of students engaged in a co-learning process that helped them choose and contextualize their images. They explored a range of issues related to food justice including transportation and urban planning, food assistance programs, and composting. The project culminated in a photography exhibit where students shared their photos with community, education, and nonprofit leaders in Salem. The project helped start discussions



around food insecurity and food justice in Salem and was part of other city-wide efforts to address a range of food-related issues in the community.

The head cook at one elementary school has initiated many programs to increase food education. The school participates in the USDA Fresh Fruit and Vegetable Program and when the school serves unusual produce such as dragon fruit, the cook does short demonstrations in the classrooms about what it looks like whole, where it grows, etc. She collaborated with the music teacher to encourage the students to write a song about cantaloupe for a contest. After the school won and received a dozen boxes of the fruit to serve at school, she helped make and distribute a video about how to cut and prepare the fruit. The cafeteria also incorporates foods that the students have grown in the garden, serving caprese salad from their tomato and basil, roasting homegrown carrots, and seasoning chicken with their thyme and oregano.

Salem High School has five working gardens, including a greenhouse, aquaculture, and a Freight Farm, and agriculture is integrated into the science curriculum.



Scituate Public Schools

Hands-on food course

All students in 6th - 8th grade take health and applied nutrition classes as part of a district-wide sequence around food education. Students learn about foods from different parts of the world, explore their own food habits, discuss issues around food access, and develop culinary skills. Using ovens and stovetops in the multi-use classroom, students have made roasted vegetables, kale chips, homemade pasta, sushi, pancakes, and cranberry sauce. Taste test activities have focused on experiencing the five senses and comparing the taste of organic and conventional fruits and vegetables. Students talk about the connection between food and culture through discussing what students' families eat on special occasions. Through this class, students learn about the importance of eating nutritious foods, the basic cooking skills needed to prepare healthy meals for themselves, as well as the value of food in everyday life.

Students are very engaged in food labs and appreciate that this class allows them to try new foods. Many report making the recipes at home and using the nutrition information they learned in the class - such as how to read labels, prepare foods safely, and understand basic nutrition - to make more informed choices about food. The students can build on that knowledge in high school, where there are electives on nutrition and exercise, and one on preparing international foods and regional foods of the US.

Springfield Public School

Farm to school coordination, hydroponic growing

Many of the school meals for the Springfield Public Schools are made in the [Culinary and Nutrition Center](#), which is operated by Sodexo, a private food service company. In the large kitchen, they are able to source and process food from local farms and the food scraps from the kitchen are sent to a nearby farm to be anaerobically digested. The student engagement manager in the food service department would like to build on those connections to offer students the ability to learn more about the farms where their food comes from and where the scraps are processed through virtual or in person field trips. Currently, the manager supervises FoodCorps members in the district, manages farm to school grants, oversees the school garden coordinator, and organizes lots of taste tests in the cafeterias to get students interested in trying healthy new foods. The student engagement manager position was originally funded through a grant from the Kendall Foundation and is now funded by the district.

Springfield Public Schools received a multi-year grant through the National Science Foundation, in partnership with Boston College, to participate in their [Changemakers](#) program. High school students grew food hydroponically, created a book of recipes, forged connections with local food producers, studied sustainability, and learned about careers in science and the food system. High school students provided near-peer mentoring to middle school students around growing, and some were paid for their work after school in the garden. The need for continued funding as well as the restriction on outside people entering the buildings due to public health guidelines have made this project difficult to maintain in this format.

Worcester Public Schools

Art in the gardens

One of the 2-D art classes offered at North High School in Worcester focuses on sustainability in art. After discussing the importance of sustainability in areas like fashion, art, and food, exemplified by the ten raised garden beds at their school, the students designed murals for the sides of the beds. They researched and practiced with all-natural and plant-derived paints, and prepared the wood for painting by sanding and dusting. Creating art in the garden has enabled the students to spend time outside in nature, beautify a space that many in the school and the community use to grow food, and apply principles of art beyond the classroom in real-world projects and studies. Through this project, students learned to conceptualize, plan, and explain their work while also cooperating with other students and applying time management and organizational skills.





Organizations and state agencies supporting food system education

There is a strong ecosystem of organizations that support Massachusetts teachers in offering food system education. Many nonprofits bring school garden, agriculture, food justice, and nutrition lessons to local schools. Others make lesson plans, professional development, and grant funding available to teachers. Several state agencies also bring food system education into schools. Among these groups there is the potential to increase information sharing and provide more centralized resources for teachers who are interested in incorporating food literacy into their classrooms.

Organizations offering food system education in schools

Many community-based nonprofits provide local schools with lessons about healthy food, school garden related lessons, and experiences such as visiting a farm and advocating for better local food options. Some send educators into classrooms to provide lessons, supplying lessons, materials, and expertise. Others provide professional development and other support to teachers so they are able to provide food literacy lessons themselves. Schools coordinate with the nonprofits to ensure that the lessons are aligned with the school's curriculum and priorities. Schools often have to pay to participate in this programming, although the organizations often receive grants to help offset the cost to the schools.

Backyard Growers

School garden education

[Backyard Growers](#) is a nonprofit based in Gloucester that provides education around food justice, nutritional agency, and environmental sustainability through creating school, backyard, and community gardens. The organization provides all Gloucester pre-K and elementary school students with the opportunity to plant, harvest, and eat two garden crops per year: Salad Days®, where students plant leaf lettuce varieties and enjoy them in June, and Fall Harvest Days®, where each grade level plants a specific fall crop that is harvested and served in the cafeteria when students return in the fall. From these experiences, students learn to make healthy choices, try new things, and experience growing vegetables.

Due to the success of their original program in Gloucester, other school districts have asked them to consult. Backyard Growers hold stakeholder meetings, lead teacher trainings and professional development, provide access to a portal with a standards-aligned curriculum, and offer a full year of technical assistance. The initial stakeholder meeting provides an orientation and answers questions and includes every-

one who will be involved in the school garden model including janitors, kitchen staff, teachers, administrators, and parents. The curriculum is flexible and helps to support the existing work of the school with the goal to create a sustainable program. The program includes three high-impact opportunities for students to get involved in growing food - planting lettuce in April, picking lettuce and planting fall crops in June, and harvesting those crops in September.

In addition, Backyard Growers teaches a middle school curriculum that connects with social studies and science classes. Sixth grade students grow, collect, dry, and pop corn as part of their science class. Seventh grade students plant, harvest, thresh, winnow, and grind wheat, and then bake bread which connects to the migration of civilizations unit in social studies. In 8th grade, students learn about soil health and its connection to the growing of all the crops they have experienced since kindergarten.

The Backyard Growers program encourages hands-on and experiential learning during the school day, and enables students to enjoy locally-grown vegetables. By incorporating the school kitchens into the process of harvesting and eating what was grown, students have shown more positive attitudes towards school foods and feel more in control of their food choices. As they enter middle school, students continue their development of food systems knowledge and healthy choices by examining the processing and infrastructure behind common foods.

Change is Simple *Sustainability lessons*

[Change is Simple](#) provides elementary and middle school classrooms north and west of Boston with at least four units per year that relate to sustainability, including climate justice, the carbon impact of growing and transporting food, waste reduction, genetically modified organisms, soil science, and pollination, among other topics. The climate-related lessons align with science, math, and English language arts standards.



Many of these lessons are taught through their Sustainability and Climate Innovation Mobile Learning Lab (SCiLL) which they bring on a trailer to participating schools. The organization also provides professional development and planning assistance to teachers. Integrating cooking projects is difficult as they often don't have access to information about student allergies. They have an online learning platform with lessons, activities, and virtual field trips of compost facilities and oyster farms. Schools pay for the course, and a portion of the cost is offset by grants that Change is Simple receives.

Teachers observe a range of outcomes for students participating in this project, including an increased understanding of content knowledge in sustainability, environmental science, environmental justice; improvement in their understanding of math, literacy, and science; and a higher level of motivation to take action for climate and environmental sustainability.

The Farm School

Field trips to a farm

Each school year more than 1,500 students come with their classes to [The Farm School](#) in Athol for one- to three-day visits. While they are on the farm, students participate in the work required to run a farm and to feed people. Students are given the opportunity to create relationships with agriculture, the natural world, and the farmers. The focus is on enabling students to have a visceral experience on a farm rather than on connecting the learning to lessons or a curriculum.

The Food Project

School garden education

[The Food Project](#), which has sites in Greater Boston and the North Shore, works at the intersection of youth, food, and community. Since 2016, The Food Project North Shore region has been working in collaboration with Backyard Growers to model Salad Days, and is currently partnering with 12 Lynn public elementary schools. The Salad Days program is designed to support the life cycles curriculum that 3rd graders receive and is an experiential learning opportunity for students that is simple for teachers and schools to implement. High school students in The Food Project's academic year programs build a raised bed for each 3rd grade class that is participating in the program. With these raised beds and thirty to sixty minutes of classroom time, students have a seed-to-fork growing experience.

The Food Project's educator helps the students plant seeds in May and then harvest the salad greens in June. They often make a salad dressing, in partnership with the UMass SNAP-Ed program, to accompany the greens, which they enjoy in the school gardens. Students from UMass Lowell also provide nutrition education.

The Food Project asks the 3rd graders to complete simple surveys to gather feedback on whether they enjoyed the experience and what they learned from it and they also collect feedback from teachers to inform the program. The program is built upon existing relationships with Lynn teachers and administrators and is funded by several foundations and individuals.

FoodCorps

Nutrition education

[FoodCorps](#) is a national nonprofit that connects students to healthy food in school. For close to ten years FoodCorps has partnered with Massachusetts communities to place emerging leaders in schools to teach food and nutrition education, support school gardens, and introduce and expose children to healthy foods in the cafeteria. In the 2021 school year, 16 FoodCorps AmeriCorps service members are supporting programming in more than 30 high-need schools across five school districts: Chelsea, Holyoke, Lowell, New Bedford, and Springfield.

A FoodCorps [research study](#) showed that students who participated in hands-on nutrition activities consumed up to three times the amount of fruits and vegetables as students who didn't receive nutrition education. Service members make long-lasting changes to student eating habits and schoolwide cultures of health through two programs. Food education service members provide hands-on and culturally responsive food education by collaborating with food service staff and teachers on cooking and gardening lessons, and conducting taste tests. School nutrition service members support school nutrition departments

to increase local sourcing, expand culturally relevant menus, and facilitate community-wide school meal engagement through social media, informational resources, and community initiatives.

Green City Growers

School garden education

[Green City Growers](#) engages students in growing food at 16 schools in the Boston Public School system as well as other public, private, and charter schools in the Boston area and beyond. The farmer educators provide materials and expertise as they teach students and teachers in weekly or bi-weekly garden sessions. The curriculum is aligned with the Science and Technology/Engineering Framework and they tailor their education programs to the goals of each class or group. Drip irrigation systems on timers provide consistent watering to the gardens and as-needed GCG maintenance visits when school is not in session ensure school gardens are productive throughout the season. GCG also engages classes in growing during the winter under cold frames, as well as in indoor growing systems.

In addition to the hands-on work of growing food and caring for their school garden, students learn about climate change and food security and justice and that being a farmer is like being a scientist. They participate in garden taste tests, make garden art, and produce value-added products from their garden harvest. Students draw and write to communicate their experiences in the garden.

In addition, thanks to funding from a USDA 2019 Farm to School Grant, Green City Growers worked with students in Boston Public School's STRIVE (Supported Training to Reach Independence Through Vocational Experience) a program for high school students with special needs, as they installed new gardens at four BPS schools. This vocational training includes learning about agricultural infrastructure, crop cultivation, and landscape maintenance. Due to the success of the program, the BPS Special Education Department funded the continuation of this project in the fall of 2021 with the installation of three additional school gardens at BPS high schools.

Grow Education

School garden education and professional development

The Marion Institute's [Grow Education Program](#) provides consultation, educational programming, and resources to support schools in southeastern MA to implement farm to school programming. This involves the planning and development of gardens to be used as outdoor classrooms, training and support for teachers to connect food system education to curriculum standards and frameworks, and connecting programming to the work of the food service department.

Working with New Bedford Public Schools, Grow Education has partnered to offer a professional development workshop which includes a five-hour in-person experiential farm workshop, and additional five hours of virtual educational support. Each school is then supported with a year of hands-on planting workshops in their gardens and presentations to support the agriculture and food system learning.

They have also designed a series of ten lesson plans which connect to the Science and Technology/Engineering, Health, and English Frameworks. Currently in the second year of programming, each school is supported by a FoodCorps member, who extends garden learning to further grade levels and supports farm to school outreach and partnerships. The program has worked closely with the school district's food service director and executive director of strategic initiatives and partnerships to ensure the program sup-

ports the thematic and curricular goals of the schools without duplicating content.

Grow Food Northampton

School garden education, field trips, and internships

Grow Food Northampton, a nonprofit that works to promote food security by advancing sustainable agriculture, runs the [Grow Food Kids](#) program which began with the goal of providing students with positive experiences on local farms. The program started by offering farm field trips to kindergarten through 3rd grade classrooms and has grown to include in-class cooking workshops offering hands-on experiences where students make and try their own meals. Pre-COVID, each classroom would receive five cooking workshops per year, as well as a farm field trip. Students now also learn about healthy local produce and how to prepare it in cooking workshops, the cultural heritage of foods, and how to grow vegetables in the school gardens, which are run by School Sprouts. Each classroom receives five lessons from Terracorp and Grow Food educators as well as one or two field trips to a community farm.

“One of the goals of our programming is to provide positive experiences and associations with healthy food and farms,” said the associate director. “Our hope is that for many students, visits to the farm and making recipes in their classrooms will form long-term memories that influence their decision-making and help them become good stewards of our common land and food system. We hear repeatedly from parents that kids come home from school, recipes in hand, and ask to make the meal again and again. Things they’ve never tried at home, they will try at school.”

As the program has grown, they have expanded to teaching older grades. They provide weekly taste tests that include local produce in the high school and host several high school interns who learn about food justice and undertake projects in the office and in the community.

In 2018, Grow Food Northampton began facilitating a collaborative farm to school effort at the district level, which sought to institutionalize and expand programming for all grades. Efforts included a Farm to School Summit and an on-going Farm to School Committee. The Grow Food Kids program has been able to provide materials such as cooking carts, educators, and field trips at no cost to the schools through funding from a Department of Elementary and Secondary Education earmark.

Island Grown Schools

School garden education

[Island Grown Schools](#), a program of Island Grown Initiative, puts school garden educators in all schools on Martha’s Vineyard. They provide lessons for grades pre-K to 12, based on the [comprehensive curriculum](#)



they designed. Island Grown Schools educators prove that every subject can be taught through the lens of food and they have created curriculum connections with students around science, math, social studies, art, and literacy. Some food system projects are: kindergarteners raise chicks, fifth graders explore the soil in the gardens, eighth graders learn to be food advocates, and all students take field trips to farms on the island. Funding for the program comes from participating schools and private donors.

Healthy Chelsea

Food justice internship

The [Youth Food Movement](#) (YFM) internship program allows high school and middle school students to advocate for higher quality food in their school and community. The students are paid for their participation and they work collaboratively with Healthy Chelsea coordinators to become food activists. Healthy Chelsea, a citywide coalition, was launched in 2010 as the result of a comprehensive Community Health Needs Assessment that identified obesity as the city's top health concern.

An annual school food satisfaction survey at Chelsea High School was organized by YFM. The school food program used the results to modify their offerings including increasing production of healthy meals that students preferred such as BBQ chicken and substituting healthier menu options. The school meal participation rate at the school increased to more than 75 percent, nutritional content improved and more students chose low-sodium, low-saturated fat meals.

YFM participants also learn about gardening and agriculture at Anita's Garden, a garden made especially for youth groups in Chelsea. They harvest food from Anita's and give it to both students in their programs and local food pantries.

Mill City Grows

School garden education and professional development

[Mill City Grows](#) has a long history of supporting access to urban agriculture in Lowell, including helping schools envision, fund, and build school gardens and outdoor classrooms. After many years of learning

from teachers about how they were using school gardens and what barriers they face in cultivating these spaces, Mill City Grows offered a two-day hands-on intensive on-farm professional development for teachers in partnership with Mass Audubon to expand school garden education.

A teacher's ability to integrate school garden curriculum varies depending on the school, the grade level, and the support of administrative stakeholders so the organization provides flexible lesson plans on multiple subject areas ranging from 10 to 45 minutes, to help promote the garden as a regular component of student learning.

Thanks to recent funding provided by a USDA Farm to School Grant, Mill City Grows, in partnership with



the Lowell Public Schools coordinator of science and social studies, is developing a set of standardized school garden science and social studies lessons at the middle school level, as all middle schools have school gardens. They plan to focus on the cultural diversity of plants and foodways; agricultural and economic history; indigenous history and the history of Lowell; and immigrant community food traditions in Massachusetts.

Mill City Grows works to ensure that school gardens are a community building and educational resource open to everyone through family garden work sessions, afterschool education/garden clubs, and CSA boxes for Lowell Public School families. Private donations also help support this work.

Sustainable CAPE

Farming education

The nonprofit [Sustainable CAPE](#) runs Farmer-in-the-School and Meet-the-Farmer programs at seven Outer Cape elementary schools. Paid farmer-educators teach outdoor classes focused on growing food and environmental stewardship while connecting grade-based teacher curriculum to the school gardens.

Regional Environmental Council

School garden education and employment program

The [Regional Environmental Council](#) (REC) partners with 25 Worcester Public Schools to provide school garden programming at on-site gardens. In the spring, they deliver compost and seedlings and organize a planting day, in the summer, they organize volunteers to help maintain the gardens, and in the fall they plant garlic and cover crops. Throughout the year they provide technical support, maintenance, and workshops.

REC organizes an after school garden club at North High School where students receive a stipend to help maintain the garden and decide what should be planted and what to do with the harvest. There is also an after school club called Seed to Fashion where students grow plants that provide natural dyes in the school garden such as indigo, marigold, onion and sunflowers. They then dye fiber, spin it, and weave at a local Japanese weaving studio to create wearable art.

In addition, REC runs the [YouthGROW Program](#) (which stands for Youth Growing Organics in Worcester), a year-round urban agriculture focused youth development and employment program for teens. The students maintain two urban farm sites, learn about food justice, and participate in leadership programming.



Statewide organizations supporting food system education

Along with organizations that provide direct programming in schools, there are many that operate statewide and provide support to schools that are offering food system education. They offer lessons, educational materials, workshops and professional development opportunities for teachers, and grants to help support this work. Many of these support organizations work in partnership to coordinate food system education throughout the state.

Massachusetts Ag in the Classroom

[Mass Ag in the Classroom](#) (MAC) is a volunteer-run nonprofit affiliated with a national organization which supports teachers to provide lessons about agriculture. They provide grants to schools to do agricultural projects or create school gardens. MAC has created some MA-specific lessons and has access to the lesson database offered through [National Ag in the Classroom](#). They offer workshops throughout the year for teachers on various agriculture topics at which farmers and producers present and MAC offers supporting lessons and materials. They receive funding from MA State Grange, MDAR, agricultural sponsors, and individual donors from the farming community.

Massachusetts Farm Bureau Federation

Massachusetts Farm Bureau Federation is initiating a program to send ag learning boxes to classrooms. These boxes are designed for grades 3 - 5 and contain an accurate age-appropriate agriculture book and teacher's guide from the American Farm Bureau Federation. The state branch creates lessons about local crops such as cranberries and apples. In the past they have also donated ag books and sent volunteers into classrooms to read ag books and give out seeds.

Massachusetts Farm to School

This nonprofit supports MA elementary and secondary schools to procure more local food and disseminate education about food. [Mass Farm to School](#) works to connect farms looking to supply food with schools that are interested in serving it. Some of the farms also host school field trips, and MFTS provides information about on farm education. They provide free materials including Harvest of the Month resources, classroom lessons, and resources for school gardens and reducing food waste. They host workshops and professional development opportunities for educators and food service staff, and the Massachusetts Farm to School Institute provides school teams with the tools to implement farm to school programs at their school.

Massachusetts FFA

[Massachusetts FFA](#) (formerly known as Future Farmers of America) is a state affiliate of the National FFA Organization. Students enrolled in agricultural educational programs, typically at career and technical high schools, can become members of the organization and participate in a variety of competitions related to skills in agriculture and leadership. FFA also offers leadership training programs and camps, as well as an annual convention. Massachusetts FFA Foundation supports Massachusetts FFA Association by raising money from businesses, industry, organizations, and individuals to provide incentive awards to FFA members and chapters.

The Massachusetts State Grange

The Grange, a nationwide organization, was formed in the late 1860s to “educate and elevate the American farmer.” Today, Grange members in nearly [50 Massachusetts local chapters](#) continue to educate their communities about agriculture through programs such as lectures, workshops, fairs, and farmers markets. The Massachusetts State Grange also partners with other educational organizations, such as 4-H, FFA, Mass Ag in the Classroom, Envirothon and the UMASS Agricultural Learning Center to provide opportunities for students from around Massachusetts to learn more about their food and how they can become involved in agriculture.

New England Dairy

For over a century, New England Dairy has championed New England dairy farm families. One of the ways this group aims to educate people about local dairy farms and encourage people to consume more dairy is through [lessons and grants for schools](#). The NE Dairy Innovation Kit is available for free on their website and provides a week of lessons about nutrition and sustainability for middle and high school students. Classrooms can participate in the Adopt-a-Cow program and follow a calf throughout the school year while learning about life on a local dairy farm. Virtual dairy farm tours are also available. Fuel up to Play 60 is a partnership with the National Football League to promote dairy consumption and exercise; there is a menu of different activities and schools can apply for grants of up to \$4,000 for materials to support the activities.

State agencies setting policy and providing support

Several state agencies provide support and set policy related to food system education. They offer student learning frameworks, professional development opportunities, school wellness policy development support, agricultural educational materials, and school garden installation. In addition, the University of Massachusetts at Amherst offers opportunities for students to learn about garden-based education, and houses the UMass Extension office, which offers the 4-H program and SNAP-Ed.

Massachusetts Department of Elementary and Secondary Education

Many offices of the Department of Elementary and Secondary Education (DESE) relate to food system education: the [Office for Food and Nutrition Programs](#); the [Office of Student and Family Support](#); the [Office of STEM](#); the [Office of History, Social Science and Civics](#); and the [Office for Career/Vocational Technical Education](#).

The Food and Nutrition Office works with food service directors and staff and can encourage them to source



healthy, local foods and to make connections with classroom learning. They provide funding for school staff to attend professional development opportunities, such as those offered by the [John C. Stalker Institute for Food and Nutrition at Framingham State University](#). The School Wellness Specialist works with schools to [improve their district wellness policies](#), which is often a way to bring more nutrition education into the schools.

The Office of Student and Family Support is [currently working with a panel of experts](#) to update the [Massachusetts Comprehensive Health Framework](#), last updated in 1999. The revised Framework will provide updated learning standards, including those related to food and nutrition topics, and guidelines for effective programming for health education, physical education, and the development of social and emotional competencies. The Department is working to schedule a date to bring a draft to the Board of Elementary and Secondary Education for discussion and a vote on releasing a version for public comment.

Many students learn about the food system in science or social studies classes so the connection to these offices is important. In addition, the [Chapter 74 programs](#) in agriculture and culinary arts fall under the vocational office.

Massachusetts Department of Agricultural Resources

The [Massachusetts Department of Agricultural Resources](#) (MDAR) provides outreach and educational materials about local agriculture to students and teachers. The Massachusetts Dairy Promotion Board provides grants to non-profit organizations to encourage the public, including students, to consume dairy products. Staff in the Division of Agricultural Markets support agricultural education and combine these efforts within the agritourism program.

MDAR has an education contract with Massachusetts Agriculture in the Classroom (MAC) to design and

develop the annual Massachusetts Agriculture Calendar, as well as develop and produce farm/agriculture related workshops for teachers and educators. MDAR and MAC work to expand ag education for the public and educators throughout the state via in person events.

MDAR works with the Department of Conservation and Recreation, Department of Fish and Game, and UMass on the annual Envirothon - a competition for high school students that focuses on environmental topics, including agriculture.

Massachusetts Department of Public Health

The [Massachusetts Department of Public Health](#) (DPH) administers the [Mass in Motion](#) program. Municipalities that participate in this program can choose from various strategies to increase community health, including focusing on school district local wellness policies around healthy food. DPH, in collaboration with the Department of Elementary and Secondary Education, also helps to

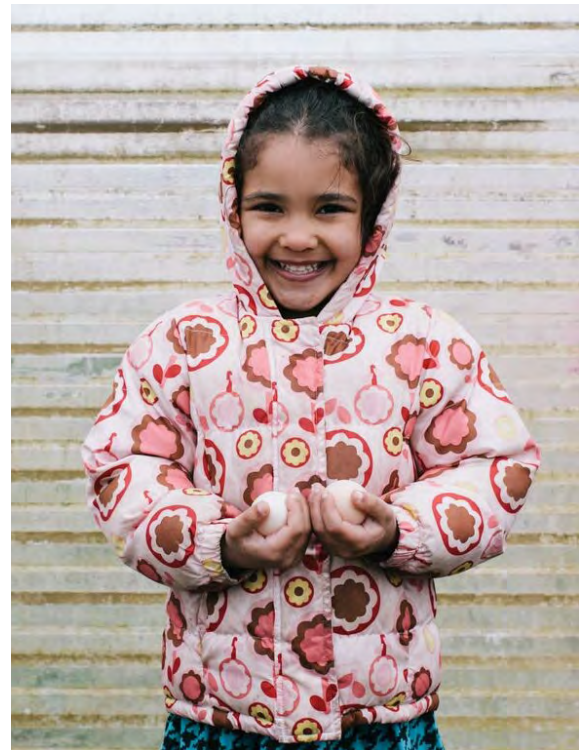


manage and evaluate a CDC grant called Improving Student Health and Academic Achievement through Nutrition, Physical Activity and the Management of Chronic Conditions in Schools. This 5-year grant enables school districts to receive training, technical assistance, and professional development to improve their school health environments to reduce childhood obesity.

MA Department of Conservation and Recreation

The [Massachusetts Department of Conservation and Recreation](#) (DCR) has a project, [Growing Wild Massachusetts](#), to educate the public about native species and pollinators. They are starting a pilot project to install pollinator gardens in existing school gardens to educate students at Lowell Public Schools. They are working with educators at the school, Mill City Grows, and a landscaper to install the gardens in the spring, create a curriculum, and invite guest speakers to the schools.

DCR also has an urban forestry program. As part of that, they host a poster contest for 5th graders around Arbor Day, with a different theme each year.



University of Massachusetts

UMass Amherst Stockbridge School of Agriculture

College students in the [Sustainable Food and Farming](#) major can focus on education through a course series called [Agricultural Leadership and Community Education](#). After learning the basics of teaching, students can participate in a small intensive internship program to gain practical experience working with elementary school students. The college students are paired with the lead garden educator and curriculum coordinator at Amherst Public Schools and help design and teach school garden lessons to students. Stockbridge recognizes more careers and professional opportunities emerging in agricultural education and offers this course work to equip students with the skills and training needed to pursue work in this field after graduating.

4-H

The [Massachusetts 4-H Youth Development Program](#) is housed at the University of Massachusetts, Amherst and is part of a national organization. They offer out-of-school agricultural and career programming as well as the Urban 4-H in-school and after-school programs in Holyoke and Springfield. Urban 4-H is focused primarily on STEM learning and careers, not agriculture.

SNAP-Ed

Nutrition education

SNAP-Ed is a national program that requires states to provide nutrition education and obesity prevention programming for low income families. In Massachusetts, these programs are implemented by four agencies and the [UMass Extension Nutrition Education Program](#) is the only school-based program. UMass Extension provides nutrition education to students in pre-K through grade 5 in some schools in which the

majority of the students qualify for free or reduced-price school meals. UMass Extension nutrition staff are guest teachers in classrooms and provide four to six lessons about nutrition. They use a lesson plan called Show Me Nutrition from the University of Missouri which covers topics including healthy food and beverage choices, food preparation, food safety, and physical activity. The lessons often include cooking demonstrations and tastings. Many classroom teachers appreciate having nutrition experts provide these lessons to ensure that they are accurate and allow teachers the opportunity to learn alongside their students.

The number of schools they are able to work in and the amount of time they are able to spend with each classroom is limited by what SNAP-Ed funding will cover. In some districts, only some schools qualify so students at different schools throughout the district are exposed to different amounts of information about nutrition. Currently UMass is designing a middle school curriculum and they don't offer high school programs.

Cape Cod Cooperative Extension provides SNAP-Ed programming for pre-K through high school students in schools that qualify based on percentage of free/reduced lunch. Nutrition educators cover topics such as healthy food and beverage choices, food preparation, food safety, and physical activity through single sessions, in-school and after-school series of lessons, displays, and cooking demonstrations/tasting opportunities. They also support starting seeds in classrooms and school gardens. Additional sources of funding allow Cape Cod Cooperative Extension to work on projects in collaboration with Cape Cod Buy Fresh Buy Local, 4-H Youth Development Program, the Agriculture/Horticulture program at CCCE, and The Master Gardeners Association of Cape Cod. Grant funding through MDAR and other community agencies has allowed for expanded educational offerings for school-aged students around fresh, local food and to provide greater exposure to local agriculture in general.





Learnings from other states

Teachers, nonprofits, schools, agencies, and community members are working to provide some MA students with engaging lessons about the food system. However, many students aren't receiving critical information about where their food comes from and how to prepare healthy meals for themselves. Many other states offer more robust and consistent food system education because of statewide policy, standards, and resources. Looking at the successful food literacy policies and programs in other states can help to inform how we might implement such practices in Massachusetts.

State legislation

State legislation can help create food system education programs, paid coordinator positions, commissions to address agricultural education, and pilot programs, and can also add food system topics to the statewide learning standards.

State level policies can ensure that there are expanded opportunities for students across the state to learn about the food system. Many states have added, or are in the process of adding, food literacy concepts explicitly to the standards. In New York, an agricultural course can satisfy a career requirement as an alternative to family and consumer science or industrial arts at the middle school level while at the high school level, ag courses satisfy the science requirement. [Pennsylvania](#) and [Texas](#) are both revising their standards to include food literacy concepts as a result of legislation. Following advocacy from two high school students, Georgia passed a law to implement a pilot program in which elementary schools can apply to participate in a program to teach food and ag concepts. The 30 participating schools are required to hire a certified agriculture teacher and receive funding, a pilot curriculum, and technical assistance from the state's education department.

Some states have created and funded positions to help coordinate food literacy work; Oregon has a Farm to School Analyst based at the Department of Education and Texas has a farm to school coordinator based at the Department of Agriculture. In Illinois, the county farm bureau system places a paid part- or full-time ag literacy coordinator in every county to provide lessons in classrooms and lead teacher trainings. Oregon uses a hub model, so each region has a farm to school network that supports the work and the state provides technical assistance grants to the local nonprofits that manage each hub. The [Food Ed Hub](#) in New York City receives \$250,000 annually from the state to support research and working groups to elevate food education. These coordinator positions can help elevate the importance of food education, provide lessons and materials that align with the state standards, support professional development for teachers, connect teachers working on similar topics, and help schools identify funding to support their work.

State task force

Several states have created task forces or commissions to bring together the agencies and organizations that help to provide food system education. These bodies ensure that food system education is a priority, help to catalog the resources available to support food system education, identify gaps and challenges, and provide solutions. State agencies that participate in the groups may include agriculture, education, environment, public health, and labor, and non-governmental organizations may include ag in the classroom chapters, farm to school organizations, extension offices, farm bureau groups, and others.

The [Pennsylvania Commission on Agricultural Excellence](#), which was championed by a farmer-legislator, was created to make ag education more robust, relevant, and efficient. They write a report on the status of ag education every spring and have worked to create shared metrics to measure progress, including the number of ag education students, the number of ag and food industry certifications earned by students in the system, and the number of open ag education positions. They have added agricultural concepts to the elementary level standards, connected educators with ag professionals to ensure students graduate with the skills to enter the workforce, and increased opportunities for supervised agricultural experiences.

Iowa's [Council on Agricultural Education](#) began in the late 1980s and has educated legislators about ag education issues and encouraged them to pass legislation to support it. They also complete an annual report and present awards to schools that provide high quality ag education.

As a result of the work of Tennessee's [Agricultural Education and Youth Participation Task Force](#), the state added agriculture topics that had previously been removed back into the standards, and hired staff at the state level to support these activities.

.....
“Food is omnipresent. Learning about the interconnectedness of food justice, food marketing, food waste, food and climate change, food security, nutrition and local/national/global food systems, etc, and the skills required to make healthy sustainable choices are necessary to be a well-informed global citizen and mindful food consumer.”
.....

Statewide programs

Statewide programs that support food system education are critical in bringing together resources and providing materials and information to teachers. They may receive state funding and support and may be housed at the state's ag department or the state's education department, the state's extension office, a university, the state's farm bureau, or a separate nonprofit organization, including farm to school organizations, ag in the classroom organizations, or school garden organizations. They can be funded through a line item in the state's budget, often associated with the education or ag department; through USDA grants; through ag license plate sales, as in Maine and California; through a farming organization; or from grants and donations as a foundation.

Programs that are based in state agencies may be less able to fundraise or advocate so some states have two organizations that work together. The [Minnesota Ag in the Classroom](#) program receives funding through the Minnesota Department of Agriculture, while the [Minnesota Ag in the Classroom Foundation](#)

raises additional funds. In Oregon, the Farm to School Analyst is based at the Department of Education, while the [Farm to School and School Gardens Network](#) is a separate nonprofit that is able to advocate for continued funding for the program.

Teacher training

To provide high quality, engaging, and up-to-date food system lessons, teachers must have appropriate training. States can support this development at various stages. There are statewide programs in New York ([New York Ag in the Classroom](#) partners with [NY Agricultural Education](#)) and California ([California Agricultural Teachers' Induction Program](#)) to encourage more people to become certified ag teachers.

This pipeline ensures that teachers have the correct training and connects qualified teachers with openings at schools.

.....
"It is very easy for teachers and students to make connections with each other when you involve food. Learning about food and cultures can help students see how similar they are to their classmates and their teacher even if they do not look alike and their ancestors did not come from the same location."
.....

Many states, often in cooperation with the state's Extension office, offer pre-service training. Ag educators teach people who are learning to be teachers how and why to include food system topics into their classrooms, often in conjunction with a science methods course. Maine Ag in the Classroom, Utah Ag in the Classroom, the [Oregon Ag in the Classroom Foundation](#), and others provide robust food literacy inservice programs. The school garden coordinator for DC Public Schools worked with Howard University to pair student-teachers with an elementary school teacher who focused on outdoor and school garden education. This program provided current teachers with additional support around food education and created a cohort of soon-to-be teachers who were comfortable teaching those concepts.

Providing ongoing high quality professional development opportunities - and ensuring that they are affordable for teachers - is also important. The [Oregon Ag in the Classroom Foundation](#) provides courses, the [Texas Farm Bureau](#) provides a four-day course in the summer for teachers which the county farm bureau often pays for teachers to attend, and the [Illinois Center for Agricultural Engagement](#) has offered a week-long summer institute to teachers for over twenty years, often serving more than 600 teachers per summer. The Washington DC Department of Education offers a five-day summer institute and partners with another organization to offer year-round support to the participants. Teachers can receive professional development credits or a \$1,000 stipend to attend. In DC there is also a community of practice for teachers involved in outdoor and school garden education which convenes monthly.

Lessons and materials

Statewide programs that provide grants and materials to teachers make it easier to implement food literacy lessons. New York provides [incentive grants](#) for schools that add an ag program. [Maine](#) and [New York](#) organize programs that tie together agricultural education and literacy - they send many copies of an ag related book to elementary school classrooms along with connected lessons. In some states, farmers volunteer to read food-themed books in the classrooms. Vermont celebrates [Agricultural Literacy](#)

[Week](#), hosted by NOFA-VT and the Vermont Department of Libraries, with a list of books about farms and food to read during the third week in November. The Farm Bureaus in Texas and Minnesota produce and distribute [agriculture magazines](#) for classrooms.

The Illinois Center for Agricultural Engagement focuses on the connections between literature and agriculture, recommending relevant books each year and partnering with the state's reading council. They also created a website to highlight ag through the state's history, supporting teachers to satisfy social studies requirements through ag. Oregon Ag in the Classroom produces and sells a textbook, [Get Oregonized](#), which is aimed at grades 3 - 5 that are studying Oregon's history and regions and includes significant sections on local agriculture and culinary traditions. Michigan has a [mobile agriculture lab](#) which travels to various schools with the materials to provide food lessons as well as 'farm crates' which are boxes of materials that teachers can order about various food topics.

There are many ways to support district and school-wide change. One approach is to include more expansive goals around nutrition education in school wellness policies. These policies are required of all districts that participate in the national school meals program and are required to include nutrition education and have a wellness policy coalition that meets regularly. National organizations such as the [Alliance for a Healthier Generation](#) and the [Rudd Center](#) provide resources to make wellness policies more robust and better implemented. In New York, legislators have proposed bills to create a model wellness policy for all school districts and provide technical assistance to help districts, particularly high need districts, to improve and implement wellness policies.

Food literacy goals can also be included in other plans. Washington D.C. has a district-wide [Nutrition Education Plan](#) which outlines the importance of nutrition education on learning, nutrition education best practices, and ways that administrators, teachers, food service directors, and family members can support the nutrition education goals.

Administrators may also be more likely to make food system education a focus if they are able to see the impact. Several national organizations have materials that make a strong case for the positive impacts of food-based learning, including the [Edible Schoolyards Project](#) and the [School Garden Support Organization Network](#).



Recommendations for Massachusetts

There are many ways in which Massachusetts can expand food system education so all students have access to this content and these essential life skills. Lawmakers and DESE should support food literacy curricula and programs through additional guidelines around teaching food system education, supported by additional funding and technical assistance. Other agencies and support organizations should support this work through increased coordination and additional resources. And all steps taken to expand access to food literacy should ensure that this expansion is done equitably through all schools and communities, particularly communities of color and low-income communities that have traditionally had limited access not just to this type of education, but to healthy food itself as well.

Introduce and enact state legislation

Add food literacy concepts to MA Frameworks

When Massachusetts Frameworks are updated by task forces organized by DESE, food system education concepts should be included more explicitly and frequently and across many subjects. Nutrition, agriculture, food justice, and basic culinary skills should be required throughout elementary and secondary education and should appear in the health standards, the science standards, and the social studies standards.

There will need to be further discussion about which DESE department should take the lead on these lessons and how interdisciplinary coordination can take place. Relevant departments are science or social studies; which department will lead the effort may depend upon where there is a champion for food literacy and the shifting requirements within each department. There should also be connections to career and vocational education, as well as civics.

Increase coordination between agencies and support organizations

The state should bring agencies and support organizations that work on food system education together to ensure that the support being provided is complete and effective and will lead to expanded food system education opportunities. These meetings should include discussions about which organizations provide grants, lessons, materials, pre-service training, and professional development, and whether there are any overlaps or gaps in these supports for schools. This collaboration should be facilitated by the Executive Office of Education and should include representatives from DESE, MDAR, DPH, DCR, UMass Extension, Mass Ag in the Classroom, Mass Farm to School, FFA, farmers and other food producers, educators, parents, and students.

Increase state funding

Provide funding for coordinator positions

Coordinator positions at the state, district, and school level support food system education. With additional funding, DESE could provide a staff person to provide technical assistance to schools. Some districts have already hired farm to school or school garden education coordinators. More funds should be made available so every district could hire a full time food literacy coordinator.

These staff are typically tasked with coordinating related work that is taking place in classrooms, the cafeteria, and the school garden, and helping schools design a food system education progression so students build on what they learned the year before and the curriculum is aligned with the standards. Coordinators can help raise funds to support the programming, and work with nonprofits that offer food system education.

Increase funding for professional development

Teachers need to feel confident in their ability to teach about the food system. There are many impactful professional development programs and courses that strengthen teachers' ability to understand the full food system, connect those concepts to their existing curriculum, and work with others at the school to create a sustainable program. DESE currently offsets the cost for some teachers to participate in food system related professional development courses through the John Stalker Institute at Framingham State University. The state should increase funding for this program so more teachers can receive regular food literacy professional development.

Increase funding for teachers to coordinate food lessons

Creating a food literacy program takes time and coordination and a DESE grant program could help defray some of the costs associated with implementing a new program. A grant program should include funds for teachers to attend professional development opportunities, stipends for teachers who work outside of school hours to design lessons and collaborate with teachers from other disciplines, and technical assistance from DESE to help design high quality lessons.

Strengthen wellness policy requirements

Local wellness policies have many required elements, including nutrition education. The state should incentivize schools to add more robust goals around nutrition education as well as achievable implementation and evaluation plans by favoring grant applications submitted by districts with strong wellness policies. DESE currently runs the Massachusetts School Wellness Coaching Program which supports districts in meeting the wellness policy requirements. With additional funding this program could impact more schools and focus more on expanding nutrition education goals.

Grant programs for food literacy lessons

To implement hands-on lessons, schools need materials. Installing and maintaining school gardens is important, as are cooking supplies and food for cooking lessons. DESE should offer a grant program to help offset the cost of materials for food system education. The grant program could provide a range of support - for schools that are starting a food literacy program for the first time, to hire a food literacy

coordinator for every school that offers food system education, etc. - however, any grant program should prioritize under-resourced schools.

Expand funding for UMass Extension SNAP-Ed programs and pre-service teaching

UMass Extension offers nutrition education to elementary school students in many low income schools. With more funding, this program could expand to serving older students and students in more communities.

UMass Extension is also well positioned to offer pre-service training to people who are in school to become teachers. UMass Extension staff could educate new teachers on how to integrate lessons about food and agriculture when teaching science methods.

Address the waitlists for Vocational Technical Schools

DESE should ensure that all students who are interested in taking vocational technical courses are able to do that. This could take the form of expanding programs, continuing to reform the application and admissions process, and encouraging non-vocational technical high schools to offer these food system career courses.

Support food system education

Make food literacy lessons available

DESE should help to make effective food literacy lessons easy to access by collecting available lessons and making high quality instructional materials available to educators. Lessons should be interactive, based on the latest research, and should align with the required standards. Organizing lessons by topic, age group, and length of the lesson will help teachers to find a program that aligns with their needs.

Collect data on food literacy participation and outcomes

More data on food system literacy throughout the state is needed. It would be useful to know how many educators are teaching food system concepts and how many students are receiving this instruction. It would also be instructive to track knowledge and behavior change as a result of these lessons through student and parent surveys and plate waste studies which track what students do and don't eat during school meals. This data could help illustrate the successes of existing programs as well as show gaps in access to food system education across schools and across grade levels and help demonstrate the need for more resources.

Provide support to food system educators

Ongoing support for teachers who provide food system education is critical to ensuring these programs continue and thrive. Additional conferences, workshops, and a community of practice could help to share best practices, introduce new concepts, and provide moral support. These events could be organized by various entities; in other states they are often organized by the state departments of agriculture or education, or by a nonprofit, with funding from the state.

Conclusion

Skills to make good choices around food are critical life skills that students should learn in school. To ensure that every student has access to this education, it is essential that agencies, school administrators, teachers, and parents agree on how important it is for students to understand the food system. There should be a widespread understanding that food connects to most classroom subjects and is a great way to do hands-on projects that help students connect what they are learning in the classroom with their experiences and interests. Growing food and caring for animals is a powerful way for students to experience social emotional learning. Food related projects are a great avenue to include students who are learning English and students with special needs. And if Massachusetts is to have a strong local food economy, the state needs more people with the skills and interest to take jobs in the food system. Not all students will become farmers, but students who understand the food system are more likely to advocate for and support farmers and producers in their communities, helping to strengthen the economic resilience of the state.

Next, there needs to be additional coordination between agencies and groups that are offering support, and more cohesive outreach to schools about the importance of teaching food literacy. Recognizing the effort that it takes for teachers to add new lessons, these support organizations should make it easy for teachers to find the resources they need to integrate food literacy into their classroom. They should be able to find high quality lessons in one place, grant opportunities to support their work, and professional development opportunities so they feel prepared and inspired to integrate food literacy into their classroom.

But individual teachers shouldn't be expected to do it alone. Coordinator positions are essential to supporting teachers looking to try something new and connecting teachers to the existing resources. Districts where these positions exist have been able to make large, systemic changes. The state, and each district, should prioritize funding these positions.

After time, insufficient funding is one of the biggest barriers to this work. There should be more funding for coordinator positions, professional development, technical assistance around wellness policies, time for staff collaboration, and materials.



Policy changes will formalize the importance of food literacy. Adding food explicitly to the state education frameworks will ensure that all teachers consider the role that food literacy plays in connection to other subjects. And making sure that district wellness policies include nutrition education in a meaningful way will help ensure that healthy food is part of every student's school experience. The state should also teach people training to be teachers how to integrate food literacy into their classrooms.

Many Massachusetts students have been able to participate in creative, engaging food system education opportunities in their classrooms, cafeterias, and school gardens. They have been able to deepen their knowledge about core subjects and learned important life skills. Policy changes are needed to ensure that all students have access to this education.



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Appendix

Resources to expand food system education at your school

Policy and programmatic changes are needed to expand food system education across the state. In addition, there are many resources available to help districts, schools, and teachers that are interested in teaching food literacy. As more Massachusetts teachers use these resources and demonstrate success in the classroom, that will help shape eventual state policy and standards.

There are many lessons about various food topics that are available for free online. Teachers may learn more about the food system as well as ideas for how to integrate it into their classroom through professional development opportunities. And finally, there are several grants which fund professional development, materials, school gardens, and farm field trips.

Food literacy curricula

It is often helpful, or even required, for teachers to demonstrate how their lessons align to the state or district standards and frameworks. Several organizations offer resources that demonstrate the connection between food system education and existing standards.

- [National Farm to School Network](#) - this database has curricular resources submitted by organizations and schools across the country, including some that align with state frameworks.
- [Life Lab Standards Database](#) - all Life Lab lessons are searchable by the standards to which they connect.
- [Curriculum for Agricultural Science Education](#) - provides pathways and curriculum connections around animal science, plant science, etc.
- [CitySprouts - Essential Plant and Design List](#) - this lists the foods in school gardens with curriculum connection examples.
- [VT FEED - Farm to School and Big Ideas](#) - lists overarching concepts to guide how food system education can be taught cohesively from K through 12.
- [National Agriculture Literacy Outcomes](#) - lists many ways that food system education connects to standards in social studies, science, and health.

Food literacy lessons

There are many lessons, workshop ideas, and reading lists that may help teachers to teach about food systems. These have not been evaluated and are organized by topic.

Food Justice

- [Grow NYC - Food Justice: In The Community](#) - provides eight lessons for high school students while

[Grow NYC - Ample Table for Everyone](#) is for middle school students.

- [Teaching the Food System](#) - teaching modules developed by the Johns Hopkins Center for Livable Future will help high school students explore relationships between food, equity, public health and the environment.
- [FoodSpan](#) - a free, downloadable high school curriculum that highlights critical issues in the food system and empowers students to be food citizens.
- [Cornell Cooperative Extension - Discovering our Food System](#) - for high school students
- [FoodShare](#) - is based in Canada and provides food justice workshop ideas for middle school students.
- [Seeds of Solidarity - Food for the SOL](#) - a compilation of lessons for youth of all ages
- [The Food Project](#) - several lessons on the food system, hunger and homelessness, and sustainable agriculture.
- [Soul Fire Farm](#) - many resources for teaching youth about the food system.
- [Swinomish and Oregon State University](#) - a 13 Moons curriculum about first foods.
- [First Nation](#) - information about the intersection with farm to school curriculum.
- [Bringing Tribal Foods And Traditions Into Cafeterias, Classrooms, and Gardens](#) - a brief from USDA with some examples of food system lessons.
- [A Culturally Responsive Hydroponics Curriculum Framework](#) - a guide to teaching about hydroponics while incorporating students' backgrounds.
- [Seedfolks by Paul Fleischman](#) - a book for middle school students about people from different backgrounds coming together around an urban garden.

Nutrition

- [The Pilot Light Food Education Center](#) - includes materials for grade K-12 searchable by grade level and subject.
- [FoodCorps](#) - lessons for elementary school aged students.
- [FreshFarm - Food Prints Curriculum](#) - for elementary school students.
- [USDA: Serving Up MyPlate: A Yummy Curriculum](#) - classroom materials about MyPlate for elementary students.
- [University of Missouri Extension - Show Me Nutrition Curriculum](#) - used by UMass SNAP-Ed educators.
- [Harvard T. H. Chan School of Public Health](#) - Planet Health is aimed at middle school students.
- [Center for Ecoliteracy](#) - materials and lessons that focus on California food.
- [Gulf of Maine Research Institute](#) - spreadsheet of lessons about seafood.
- [Sea To School: A Guide For School Cafeterias & Classrooms](#) - ideas on how to get started, along with case studies.

Agriculture

- [National Ag in the Classroom](#) - provides a large database of lessons, many of which are connected to state specific standards.
- [University of Wisconsin - Madison Center for Integrated Agricultural Systems - Toward a Sustainable Agriculture](#) - for high school students.

- [Mass Ag in the Classroom](#) - lessons about dairy for all ages.
- Slow Food USA [Plant a Seed](#) Program.
- [Farm Journal Foundation](#) - online videos and lessons about farming and farmers for middle and high school students

Sustainability

- [A People's Curriculum For The Earth - Teaching Climate Change and the Environmental Crisis](#) - this booklet focuses on sustainability and the food system.
- [Boston Public Schools - Climate Curriculum](#) - created in collaboration with students, for elementary through high school.
- [The Green Team](#) - activities for schools to be more sustainable.
- [USDA Climate Hubs](#) - units about climate change topics.

School gardens

- [Island Grown Foods](#) - curriculum toolkit is thorough and well-organized for all ages.
- [The Edible Schoolyard Project - Resource Library](#) includes materials for grade K-12 searchable by grade level and subject.
- [Life Lab](#) - science in the garden and school garden lesson plans.
- [Collective School Garden Network](#) - garden lessons, literature lists, and cooking projects.
- [Kids Gardening](#) - lesson plan database.
- [Whole Kids Foundation and American Heart Association](#) - school gardens activity guide.

STEM

- [US FDA Science and Our Food Supply](#) - middle school or high school level.
- [FoodMASTER](#) - a food-based science and math curriculum for grades 3 - 8. The curriculum was evaluated in counties in Ohio and North Carolina and found that it increased students' and teachers' understanding of math, science and food concepts.
- [National Geographic](#) - Science and food lessons.

English / Language Arts

- [Life Lab](#) - several lists of relevant books.
- [Growing Minds](#) - a list of food-related books searchable by diverse characters and in Spanish.

Farm field trips

To locate farms in MA that offer school tours, go to [MDAR's map](#). Click search and under crops and activities, select school tours.

- Mass Farm to School has [guides](#) and a [webinar](#) about doing field trips on farms.
- The [Farm Based Education Network](#) has resources for farms that welcome school trips.

- Mass Audubon's [Drumlin Farm](#) hosts many school field trips and can focus on farming and agriculture.

Professional development opportunities

There are many professional development options for teachers who are interested in learning more about the food system and how to integrate food system concepts into their classrooms.

- [Exploring Food from the Ground Up](#), John Stalker Institute. The John Stalker Institute at Framingham State University offers many four-week online graduate courses for educators and school professionals that are focused on promoting school wellness. One such class is "Exploring Food from the Ground Up" which provides participants with examples of schools that are teaching about food, shows them how to connect those lessons to the curriculum, and lists grant opportunities to help support the lessons.
- [The Massachusetts Farm to School Institute](#), Mass Farm to School. The Massachusetts Farm to School Institute is a year-long professional learning opportunity for school teams from across the state. During a fall retreat, participants develop a comprehensive school-wide Farm to School Action Plan that includes curriculum, local procurement, utilizing outdoor learning spaces, and cultivating family and community connections.
- [Backyard Growers](#). Backyard Growers offers consulting and professional development for teachers that would like to offer more school garden-based education.
- [Grow Education](#). Grow Education offers consulting services for new and existing community garden and cross-cultural outreach programs.
- [Northeast Farm to School Institute](#), Vermont FEED. Vermont FEED organizes this year-long institute for educators to build relationships, skills, and a collaborative action plan to increase farm to school activities in their classrooms, cafeterias and communities. Participants must apply with a team from their school or district, including classroom teachers, food service staff, and administrators. In person events take place in Shelburne, Vermont. A [guide](#) to building a whole school program is here.
- [Sustainable Schools Project](#), Shelburne Farms. The Sustainable Schools Project is a whole-school professional learning model designed to help schools use sustainability as an integrating context for curriculum, community partnerships, and campus practices.
- [Food Education Fellowship](#), Pilot Light Chef. Pilot Light Chef is a nonprofit based in Chicago. They offer a year-long course for teachers who are interested in using food education as a tool in their classrooms which includes monthly, virtual professional development. They also offer stand-alone professional development opportunities.
- [Curriculum for Agricultural Science Education](#). CASE is an initiative of the National Council for Agricultural Education and offers an institute as well as many other courses about teaching agriculture, food, and natural resources.

Grant opportunities

Grants are available to implement school gardens, purchase other materials for teaching about agriculture and nutrition, and for professional development opportunities.

- These are two general resources from USDA - [for educators](#) and about [funding](#).
 - [Farm to School Grant Program](#) - Provides funding to many aspects of farm to school programming. One priority is for the program to, "Incorporate experiential nutrition education activities in curriculum planning that encourage the participation of school children in farm and garden-based agricultural education activities." [USDA Farm to School Grant fact sheet](#)
 - [Agriculture and Food Research Initiative - Education and Workforce Development](#) - Provides funding for, among other things, "professional development opportunities for K-14 educational professionals." See past grantees [here](#).
- [Food and Agriculture Service Learning Program](#) - Provides funding to, among other things, "Increase capacity for food, garden, and nutrition education within host organizations or entities and school cafeterias and in the classroom." See past grantees [here](#).
- [The Kendall Foundation](#) - This private foundation focuses on a sustainable and resilient food system in New England; one priority is farm to school programs.
- [Mass Ag in the Classroom](#) - Provides mini-grants to teachers for supplies to teach about agriculture.
- MA [Skills Capital Grant Program](#) - Grants for equipment to support vocational and technical training.
- [New England Dairy](#) - Offers grants to schools that are providing lessons that include dairy.
- [Whole Kids Foundation](#) - Grants available for school gardens, education about bees, entrepreneurship skills, as well as a free healthy teachers program.
- [Budding Botanist Grant](#) - Has a small grant to support garden education.
- [The EOS Foundation](#) - Has offered support for farm to school research and programming.
- [Shaws Nourishing Neighbors](#) - Provides funding for youth, education, and nutrition.
- [National Science Foundation](#) - Provides grants for teachers around various science topics.
- [The School Garden Support Organization Network](#) - Offers many ideas for funding school gardens.

MA Food system education examples by topic

Food system education can be taught in virtually every subject and at every level. This list categorizes the examples in the earlier section for reference.

STEM

- Elementary
 - General science alignment: Amherst Public Schools
 - Raising chickens: Island Grown Schools
 - Soil science: Island Grown Schools
 - Learning from farmers: Sustainable Cape
 - Climate change: Change is Simple
- High School
 - Lab science: Innovation Academy Charter School
 - Horticulture: Dennis-Yarmouth Regional High School
 - Biology: Four Rivers Charter School

Math

- Elementary
 - Area of the school garden, barn etc.: Hawlemont Regional Elementary School

Social Studies

- Elementary
 - Ancient civilizations and culinary traditions: Hawlemont Regional Elementary School
- Middle
 - Ancient civilizations and agriculture: Mill City Grows
 - Local history and native foodways: Backyard Growers
- High School
 - History of land, agriculture and culinary traditions: Innovation Academy Charter School; Amherst Public Schools
 - Immigration and culinary traditions: Lowell High School

Culinary Skills

- Elementary
 - Basic cooking skills, taste tests: FoodCorps; Grow Food Northampton
- Middle
 - Hands on food course: Scituate Public Schools; Norwell Public Schools
- High School
 - Culinary Vocational Technical Schools: Diman Regional Vocational Technical High School
 - Cooking Class Electives: Lowell High School

Health and Wellness

- Elementary
 - Basic nutrition: SNAP-Ed
- Middle
 - Design a food truck project: Norwell Public Schools

Social Justice

- Elementary
 - Photo voice food project: Salem Public Schools and Salem State University
- High School
 - Food justice: Healthy Chelsea; REC Youth GROW

Art

- High School
 - Sustainability, Art and Food: Worcester Public Schools

Library

- Elementary
 - Books coordinating with School Nutrition Month: Cambridge Public Schools

Cafeteria

- Elementary
 - Highlight unique fruits and vegetables in classrooms: Salem Public Schools
 - Coordinating meals with what is being made in culinary classes: Northampton Public Schools

- High School
 - Highlight healthy and local meals and serve local seafood: Chicopee Public Schools
 - Composting and Food Waste: Springfield Public Schools; Northampton Public Schools
 - Serving meals connect to students' family recipes: Lowell High School

School Gardens

- Elementary
 - Planting and Harvesting: Many schools and many nonprofits
- Middle
 - Planting and Harvesting: Backyard Growers; Lowell Public Schools
- High School
 - Hydroponics: Boston Green Academy; Boston Public Schools; Salem Public Schools
 - Production Garden: Norfolk County Agricultural High School

Field trips to farms

- Elementary: Grow Food Northampton; The Farm School; Salem Public Schools
- High School: Lowell High School; Innovation Academy Charter School

Students with Special Needs

- High School
 - Building gardens: Boston Public Schools and Green City Growers
 - Project-based food course: Next Wave/ Full Circle
 - Food systems: Amherst Public Schools

Student Participation

- High School
 - High School internships: Healthy Chelsea; Grow Food Northampton
 - Environmental groups: Northampton Public Schools

Schools with food systems coordinator position

- Amherst Public Schools
- Boston Public Schools
- Chicopee Public Schools
- Northampton Public Schools
- Springfield Public Schools
- Salem Public Schools



Photo credits

Cover: top, clockwise: Amherst Public Schools, Scituate Public Schools, Salem Public Schools

Page 1: Island Grown Schools

Page 2: Change is Simple

Page 8: Holly Hill Farm

Page 11: Grow Food Northampton

Page 14: Chicopee Public Schools

Page 17: Lowell Public Schools

Page 18: Northampton Public Schools

Page 20: Scituate Public Schools

Page 21: Scituate Public Schools

Page 22: Worcester Public Schools

Page 24: Food Corps

Page 27: Grow Food Northampton

Page 28: Mill City Grows

Page 29: Backyard Growers

Page 31: Regional Environmental Council

Page 32: Scituate Public Schools

Page 33: Island Grown Schools

Page 34: Island Grown Schools

Page 42: Amherst Public Schools

Page 43: Mill City Grows