GEORGIA FOOD SYSTEM SUSTAINABILITY: A FACILITATOR'S GUIDE

Joel Jarrell

September 2016

Montreat College

© 2016 Joel Jarrell

Work submitted in partial completion of a Master of Science in Environmental Education
Montreat College, Montreat, NC 28757

MONTREAT COLLEGE

School of Adult and Graduate Studies

This is to certify that the following professors have examined this thesis by
Joel Jarrell
in final form for submission as partial requirements for a
Master of Science in Environmental Education Degree.

Dorothea K. Shuman, Ph.D.

September 30, 2016

Richard B. Daniel, Ph.D.

September 30, 2016

Montreat College Final Approval and Acceptance:

Vice President & Dean, Adult and Graduate Studies, Susan DeWoody

September 30, 2016

ABSTRACT

The purpose of our nation's food system is to provide all of the caloric demands of each American. This system which provides us with sustenance has evolved tremendously over the last century and an understanding of the environmental impacts that the system has created along the way needs to be explored. Educating consumers presents them with the opportunity to think critically about what their food choices mean and whether those choices are sustainable. The state of Georgia and the city of Atlanta stand at the crossroads of change in our food system through their role as a major agriculture state and a metropolitan area steeped in food culture, respectively. The purpose of this project was to develop a facilitator's guide that supports Georgia educators in providing their students with a better understanding of Georgia's role in our food system and to help students understand the implications of their food choices.

ACKNOWLEDGMENTS

The completion of this facilitator's guide would not have been possible without the professional support of The Westminster Schools in Atlanta, Georgia. I sincerely thank the Center for Teaching at Westminster for granting me access to their wealth of resources as well as the faculty and staff at Westminster who have supported this project. I also wish to thank Dr. Dottie Shuman and Dr. Brad Daniel for their support and patience with me as I waded through the long development process of this project. Dr. Shuman's diligence and understanding of my work was crucial in ensuring its success. I would also like to thank all my family, including Jake Horne for his masterful editing skills, and especially my son Bennett who always reminds me to be humble and patient. Lastly, I give the biggest praise to my wife Emily whose support of me extends beyond simple words of encouragement. Emily is a true co-author of this project and many of her ideas provide the backbone for what can be found within its pages. Without her, my partner in crime on this project, I never would have made it through.

TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER 1.

INTRODUCTION

We all need to eat. This basic biological fact will always be one of the strongest connections that exist amongst the human species. Adequate nutrition "is composed of sufficient macronutrients and micronutrients, the combination of which provides energy, nutrients, vitamins, and minerals" (Neff, 2015, p. 403). This need for sustenance, tied with the need to consume water, is something that binds all of us together across all cultural, political, or geographical divides. We all need to eat, however the specific way in which we go about getting the food we eat is constantly changing. To help navigate these changes, food system literacy is of great importance.

Agriculture once had a much different look to it. Gone are the days of a farmer using slash and burn techniques to clear a small plot of land which was worked to produce a modest amount of food, until the fertility of the soil was exhausted (Neff, 2015). The advent of the Industrial Revolution and the invention of the "steel plow, mechanical seeders, and steam-powered threshers" meant a significant shift towards a more industrialized model of food production (Neff, 2015, p. 268). Since World War II changes have really snowballed as innovations in chemical fertilizers and energy intensive farm equipment have played a profound role in the evolution of agriculture into agribusiness (Neff, 2015). This coupled with new federal policies supporting these changes created a much different food system than that which existed prior to the 1940's (Neff, 2015).

The need for the Facilitator's Guide

Author and farmer, Wendell Berry (2009) advocates that consumers have become passive in our approach to our food, preferring to have others make decisions about our food for us. Berry writes, "When food, in the minds of eaters, is no longer associated with farming and with the land, then the eaters are suffering a kind of cultural amnesia that is misleading and dangerous" (Berry, 2009, p. 228-229). There is even more potential to disconnect from the land where our food is grown and the impacts upon that land as our country sees an ever growing shift away from the rural lifestyle that dominated our society since its inception. A movement away from the pastoral life of our ancestors towards the more urban life that dominates most American's lives today. Urbanization increased in the 1950's to the point where today over 80% of Americans live in urban settings (Spence, Annez, & Buckley, 2009). When asked "What can city people do?" Berry responds, "Eat responsibly", meaning stop being passive components of the food system and instead take a more active role (Berry, 2009, p. 227). However Berry doesn't stop there. He also suggests that each of us educate ourselves about the economic drivers of our food system and the technology involved with production. That until we do, we are "neglecting to understand that we cannot be free if our food and its sources are controlled by someone else" (Berry, 2009, p. 229).

This paper describes the need and process of the development of an experiential food system facilitator's guide. The facilitator's guide was developed to further the food system literacy of high school age students in the state of Georgia and specifically for independent schools in the city of Atlanta. The literature review (Chapter 2) highlights the need to help learners understand the impact that their food choices may have on the environment especially in

the state of Georgia, which has an extensive agricultural history. The literature also supports the need to educate learners about how their food choices may impact the social and economic sustainability of Atlanta as well. The methodology that was used to design the activities for this guide (Understanding by Design) will be described in Chapter 3. David Kolb's experiential learning cycle (1984) was used as a method of delivery when designing this guide and will be discussed in this chapter as well.

Operational Definitions

Food System- A system that involves all the resources (inputs) and impacts (outputs) necessary to produce, process, distribute, market, prepare, consume, and dispose of the food we eat. This system has a number of drivers, some visible and some hidden, that have shaped our food production since humans became an agrarian society (Neff, 2015).

Sustainable agriculture- Production of food and other needed products, such as fuel and fiber, in a way that ensures that economic needs are meet for the farmer, environmental impacts are mitigated, and quality of life is assured for communities where production is taking place (*What is Sustainable Agriculture?,* 2010).

Experiential Learning Cycle- a four stage learning cycle that is meant to engage the learner through (1) a concrete experience, (2) opportunity for reflection so the learner can make personal meaning of the experience, (3) abstract conceptualization so that the learner can further analyze the experience, (4) active experimentation through which the learner applies their new knowledge and are also afforded the opportunity to transfer what they have learned to a new setting. Though cyclical in nature, the learner can enter the cycle at any of the four stages as needed.

CHAPTER 2.

LITERATURE REVIEW

In its most simple form the food system could be discussed as the relationship between a producer (a farmer, rancher, etc.) and the consumer. However, this is an oversimplification since our actual food system is far more complex and may be more accurately described as "all the activities and resources that go into producing, distributing, and consuming food; the drivers and outcomes of those processes; and all the relationships and feedback loops between system components" (Neff, 2015, p. 2). The complexities of the system can be bewildering and can cause those that may want to understand the particulars of where their food comes from to become overwhelmed by the ever evolving system, which has multiple steps each with array of inputs and outputs.

Svenfelt and Carlsson-Kanyama (2010), utilizing the earlier work of Waltner-Towes (1991), draw attention to the issue that "the separation of production and consumption has created a mental gap between human and the biological sources of their food, and that gap has formed a food production and distribution system of an environmentally degenerative character" (Svenfelt and Carlsson-Kanyama, 2010, p. 454). To that end, problems have arisen such as animal welfare, soil degradation, polluted waterways, and excessive production of greenhouse gases as well as social issues relating to food production such as farm-worker exploitation and food insecurity. However research has shown that is difficult for many Americans to glean a deep understanding of these issues (Hesterman, 2011). Add to this an increase in urbanization. As many Americans move back into the city they, the consumer, are further removed from the

place where there food is grown, in turn limiting the consumer's opportunity to fully understand the ecological impacts our current industrial food system has on our environment (Svenfelt & Carlsson-Kanyama, 2010). At the same time the choices of that consumer remain a driving force behind the food system (Svenfelt & Carlsson-Kanyama, 2010).

As our world population continues to grow, the impacts from producing and acquiring the basic human need for food are becoming more and more prevalent. The journey that our food takes from the farm to our plate can be unclear and these impacts along the path may go unseen by many consumers. However, it has been argued that a more informed and educated consumer may have a positive effect on the food system's functioning and that we need "institutions with far greater transparency and openness then tends to be the case now" (Tansey, 1994, p 4). Ignoring issues with our food system does not help mitigate them and yet 2015 data from the International Food Information Center shows that the sustainability of our food is of minor significance to consumers especially when compared to other things such as perceived healthfulness of food and convenience (International Food Information Council Foundation, 2015). It has become imperative that we prepare ourselves as well as future generations of consumers to look at food with a critical eye especially in the face of a rising global population; increased urbanization, removing us further and further from the source of our food; and a globalization of our food market, where money and power of food production is controlled by a relatively small number of companies (Tansey, 1994). To that end the intention of this literature review is to support the need for this project which involved the development of a facilitator's guide for the state of Georgia that will prepare the next generation of consumers to think critically about the ramifications their choices made within our food system.

Why Teach About Food Systems

The Belgrade Charter (1975) which provides a global framework for the work of environmental education (EE) states that the goal of EE is:

> To develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones (p. 15).

The Belgrade Charter established, and further enhanced by the Tbilisi Declaration, that the first objectives of EE is: to raise awareness and knowledge within the learner in order to move them towards active participation in making a change and becoming an environmentally literate individual (Belgrade Charter, 1976; Federal Interagency Committee on Education, W. D. & Department of Health, E. D., 1978). This flow of moving the learner - from awareness to knowledge and understanding to active participation and civic engagement - can be seen in the writing of those who advocate for food system literacy. In his book, *Fair Food,* founder of the Fair Food Network, Hesterman (2011), commits almost two-thirds of his writing on discussing the current state of our food system and what a healthier and resilient food system could look like. It is only within the final section that Hesterman encourages the reader to move "from conscious consumer to engaged citizen" (Hesterman, 2011, p. 129). Food system education offers opportunities for the learner to become aware of issues they may not have known existed and gain knowledge and understanding of how those issues affect something as intimate as the food that they eat. Once made aware the learner can then move towards being engaged in

actively working towards resolving the issues (Federal Interagency Committee on Education, W. D. & Department of Health, E. D., 1978).

Issues of scarcity and issues of waste. There are numerous issues with our current method of food production. Highlighted here are just a few which could be mitigated through a more actively engaged citizenry.

According to the United State Census Bureau our country's population has a net gain of one person every 16 seconds (United States Census Bureau, n.d.). As our population grows so does the need for resources to support each American. The large industrial nature of our current food system continues to dominate and should ideally provide enough food for each citizen of our growing country. However, even with a food system that is able to produce massive amounts of food the issue of food insecurity remains relevant for upwards of 14% of American households in 2014 (Coleman-Jensen, Rabbitt, Gregory, & Singh, 2015). Household food insecurity is defined by the United States Department of Agriculture (USDA) as a situation in which "their access to adequate food is limited by a lack of money and other resources" (Coleman-Jensen et al., 2015, p.v). The issues behind food insecurity throughout the country are complicated. Economic decline, growing poverty rates, and decreased access to healthy food in areas that have come to be called food deserts are just a few of the contributing factors surrounding the issue of food insecurity that can frequently be difficult for us to understand (Neff, 2015). However, at the same time many households just may not have enough food to eat, research has shown that other households are throwing away large quantities of food. Hall, Guo, Dore, & Chow (2009) estimate that in the United States around 40% of all the food produced is wasted. It is important to note that this food waste can come from all points of the supply chain,

from production to consumers. However over half (21%) of the food wasted in the United States occurs at the consumer level (Buzby, Wells, & Hyman, 2014). Oftentimes this waste is a result of confusion over the "sell by" label provided on the food product. These under-regulated labels are often misleading. They are essentially a best guess of how long a food product will remain at peak quality. They are not an accurate indicator that the product has spoiled or otherwise become unsafe (Leib, Rice, Neff, Spiker, Schklair, & Greenberg, 2016). The span between the two means that a significant amount of perfectly good food is discarded. Recent findings indicate that those belonging to the millennial generation (18-34 years old) were far more likely to throw out food based solely on the sell by label (Leib et al., 2016).

By reducing our food waste by 30%, the resources allocated to produce that food, and subsequently wasted, could instead be used to resolve the issue of food insecurity by providing all the caloric needs of every food insecure individual in our country (Buzby et al., 2014). Food insecurity can be mitigated by the actions of each of us simply by reducing unnecessary food waste. This careful consideration of the waste stream begins with educating ourselves and especially a younger generation on what labeling means.

Environmental impact from current inputs. Environmental impacts of our industrialized food system can also be a poorly understood topic for many of us. The Union of Concerned Scientists define our current dominant food system as one that is failing us as a society due to: its heavy use of chemicals and fertilizers during production and their runoff into rivers and streams; the burning of fossil fuels for food distribution; and release of methane from concentrated animals feeding operations and from landfills full of food waste (Union of Concerned Scientists, n.d.). Our planet provides a wealth of resources, which in turn allows us

to grow our food. These provisioning ecosystem services include fertile soil, freshwater, and genetic diversity (Neff, 2015; Sarukhan & Whyte, 2005). It is important to note though that the value of these ecosystem services, in addition to the value of our planet's ability to regulate its climate and manage disease, are not considered as a cost of doing business in agriculture. The self balancing of our ecosystem and the resources it provides are instead externalized by many of us as things having less value than the cost of other inputs such as seeds, machinery, or agricultural chemicals (Neff, 2015). However, whether we place a dollar value upon them or not, it is estimated that around 60% of the life-sustaining ecosystem services provided by our planet are either degraded or used in way deemed unsustainable and that these detrimental impacts are inextricably linked to our drive to produce more food (Sarukhan & Whyte, 2005). Since the 1950's tremendous amounts of land have been converted into agricultural use for concentrated animal feeding operations (CAFOs) which are meant to fulfill our demand for more meat for our diets. Additionally, our use of petroleum based chemical fertilizers has increased exponentially since 1985 compared to the 70 years prior (Sarukhan & Whyte, 2005). Agricultural activities, such as nitrogen-based fertilizer use and livestock production, currently produce around 30% of the anthropogenic greenhouse gas emissions on our planet contributing to a warmer planet, which in turn necessitates a change in agricultural activities (Neff, 2015).

What role does education play in mitigating the environmental and social impacts described above that our current food system creates? Can knowledge and understanding of the topic of food help reconnect consumers to the larger food system?

As Wendell Berry said "eating is an agricultural act" (Berry, 2009, p. 227). By consuming our food we take part in something that is much bigger than just simple calories

entering our bodies. We engage with a system that may have begun months and months before when a farmer, rancher, fishermen, etc. first brought their harvest to market. By eating we are connected to those that produced our food; however many consumers never give this any thought. Urban dwellers in the city of Atlanta may be further disconnected from the production of their food due to the fact that they have never set foot upon a farm. They may miss or dismiss what Sundkvist, Milestad, & Janssonc (2005) referred to as feedback signals (from an unhealthy ecosystem) that our method of industrial food production is actually harming the environment and requires modification in order to prevent serious ecological damage.

However, by acquiring an understanding of where that food came from and how it got to our plates we are afforded greater insight of these issues and therefore an opportunity to have a voice in modifying the process. Research has shown that by providing learners with information about topics such as the value of eating more local foods, reducing food waste, and choosing alternatives to animal based protein, it is possible to increase those learners' knowledge of food related issues (Monroe, Lofgren, Sartini, & Greene, 2015). Monroe et al. (2015), also found that educating learners about these topics not only increased knowledge but also successfully promoted eating behaviors that were more sustainably focused. Further that "informing consumers of sustainable food choices" highlighted in their project, "could potentially motivate them to adopt dietary changes and ultimately assist in mitigating the environmental impact of the food system" (Monroe et al., p. 2377).

In 2006 author and food system advocate Michael Pollan encouraged people to "vote with their fork" (p.1). This meant that consumers must first educate themselves about their food which in turn would then offer them the chance to make their wishes known about what they

think the food system should be, based off of what they buy or do not buy. The market forces of consumer choice influence the means of production. Additionally, many choices about the food we eat are decided for us through the intricate dealings of federal food policies, as well as Georgia state and local laws, operating in multiple sectors including agriculture, health, food safety, transportation, environment, and business (Neff, 2015). However Neff advocates that there is potential that policies established by elected officials that govern the food system, could become "a vehicle for expressing public interest" (Neff, 2015, p. 186). By becoming more literate about our food, we become empowered and engaged in the journey of our food rather than just a link in a food chain, far removed from the others.

By reconnecting consumers to the food system we are also offered a chance to see how the entire system continues to evolve. Research conducted by the USDA seems to suggest that there may be some growth in alternatives to the industrial food system under which we currently operate. For example, recent years have yielded an increase in the number of farms focused on local marketing through direct to consumer sales of their products. However those alternatives still comprise a small percentage (7.8%) of the overall production of food in the United States (Low, et al., 2015). Nonetheless, there is strong data that suggests that the movement towards alternatives to our current industrialized food system is beginning to gain steam. Organic farming, defined as the production of food without the use of petroleum based fertilizers or pesticides, of transgenic seeds, or of sewage sludge as fertilizer, has risen to a $30 billion dollar industry in the United States (Neff, 2015). Farmer's markets, where consumers can meet face to face with the person(s) who produced their food, saw a 180% increase between 2006 and 2014. Regional food hubs which aggregate and market locally sourced food increased by 288% (Low,

et al., 2015). However, even these alternatives to the industrial food system are not without some caveats. Oftentimes consumer perception is that a more local food system is more sustainable and environmentally friendly (Neff, 2015). However according to the USDA this may not be the case in as much as many farms focused on local sales can use just as many environmentally harmful chemicals as their industrial counterparts, as well as produce excessive carbon dioxide emissions from inefficiencies in transportation (Low, et al., 2015). These sorts of complex consequences of our food choices can be difficult to navigate. However research has shown that with the right type of educational experience in place it is possible to increase a learner's knowledge and to encourage behavior that can notably decrease the negative impacts of our current food system (Monroe et al., 2015).

Why Teach About the Food System of Georgia

According the Georgia Farm Bureau, agriculture is one of the Georgia's oldest and largest industries and this long and storied history has led to the food system that has become one of the most common ways that Georgians make a living with one in seven Georgians working in agriculture, forestry, or related fields (Georgia Farm Bureau, n.d.). Examples of the abundance of food that the state is capable of producing is evident in the numerous Georgian counties that are known for producing more chickens for meat than any other state as well as nearly half of all the peanuts grown in the United States (United States Department of Agriculture, 2015; National Peanut Board, 2016). Research has shown that while the number of individual farms in Georgia may be on the decline, the value of the products being sold has seen a significant increase (Kane, Wolfe, Jones, & McKissick, 2010).

If Georgians choose to devote $10 from their weekly food budget to purchase Georgia grown produce it would provide a $1.9 billion increase to the state economy (Kane, et al., 2010). Yet in a state that is incredibly rich in agriculture and is reliant upon the continued success of that agriculture as part of the state's economic well-being, a number of unsustainability issues, like those mentioned above, play out around Georgia as well. According to various research studies, the national average for food insecure households is around 14% (Coleman-Jensen, et al., 2015). At the same time the state of Georgia with its high level of food production, finds itself as one of the most food insecure states in the country with nearly 18% of Georgia households being food insecure (Gunderson, Satoh, Dewey, Kato, & Engelhard, 2015). Furthermore, the nine counties that comprise the Atlanta Metro area (Fulton, DeKalb, Gwinnett, Cobb, Clayton, Coweta, Douglas, Fayette, and Henry) with their dense population centers make up almost 35% of the total number of food insecure households statewide (Gunderson et al., 2015). However, it is estimated that around 800,000 tons of food waste ends up in Georgia landfills each year (Georgia Department of Community Affairs, 2005). The irony of the discrepancy can't be more evident and the opportunity of possible solutions obvious.

While many Georgians struggle with food security the industrial food system of Georgia creates a number of environmental issues as well. Georgia's number one agriculture commodity is the raising of chickens for meat, otherwise referred to as broilers, which contributed almost 4.5 billion dollars in 2013 to the state (Center for Agribusiness and Economic Development, 2014). The industrialized chicken industry may be a boon to the state in terms of job creation in the production, processing, and distribution markets; however it also comes with significant environmental impacts. Chickens raised in Concentrated Animal Feeding Operations (CAFOs)

produce large quantities of waste, referred to as broiler litter, which is often used as a fertilizer on neighboring fields due to its high concentration of nitrogen and phosphorous (Pew Campaign to Reform Industrial Animal Agriculture, 2011; Neff, 2015). According to research by the Pew Charitable Trust's Environment Group the level of production around the state means that there was an average of over 200 broiler chickens for each acre of cropland available (Pew Campaign, 2011). This has resulted in an over abundance of waste being used on crops. As cited in the Pew Charitable Trust's study, 13 counties around the state of Georgia had an excessive amount of phosphorus, commonly found in chicken litter, in the soil with 10 of those counties being in areas of high poultry farm concentrations (Pew Campaign, 2011). When an excess of waste is applied as a fertilizer there is a higher chance of run off into local surface water sources causing eutrophication because of excessive algae bloom, which in turn leads to serious loss of aquatic biodiversity and even harm to humans along the Georgia coast and in the Gulf of Mexico (Pew Campaign, 2011).

Though Georgia's contributions to the detrimental impacts of the industrial food system can be a cause for concern, there is also a wealth of success stories centered upon reductions in the state's impact to be learned about as well. Research suggests that Georgia is experiencing an increased engagement in what is referred to as "civic agriculture" (Furman, Roncoli, Nelson, & Hoogenboom, 2014). This term was first extensively written about by Lyson in 2004 and describes an agricultural system that is locally based and developed in order to help mitigate climate change issues associated with the growing of food. Lyson (2004) also advocated that civic agriculture also meant a much tighter link between the social and economic development of a community. Farmers engaging in civic agriculture in Georgia recognize the impact of climate

change upon their livelihood and the need for a new approach to the way they grow food including a move away from large scale production; production which requires large amounts of inputs and a movement towards small and medium scale production (Furman et al., 2014). However, without consumers educated about civic agriculture and its positive role in our food system who will intentionally purchase the food from these environmentally committed farmers?

Another food success story can be found in the heart of Atlanta where food insecurity is rampant and accompanies a poverty rate that has grown to encompass over 1 million more people since the year 2000 (Atlanta Community Foodbank, 2013). In one of these neighborhoods, the Old Fourth Ward, residents live in what is called a food desert. A food desert is defined as an area in which citizens have low access to healthy food (Neff, 2015). However within the Old Fourth Ward there is an organization seeking to help eliminate this desert. Truly Living Well Center for Natural Urban Agriculture (TLW) was founded in 2006 and seeks to help "empower communities with food self-sufficiency, builds economic capacity, and maintains stewardship over the local environment" (Truly Living Well, 2013). The urban farm that TLW started in the Old Fourth Ward has now grown to five sites around the city and serves as an example for others about how to work alongside community members and collaborate to create transformative food systems.

The Gap in the Curriculum: Telling the Food System Story

There does not exist, at the time of the development of this project, a resource for teachers to help learners understand the environmental impact that their food choices can have on the state of Georgia. Existent food system curriculum such as the work done by the Johns Hopkins Center for a Livable Future (CFL), though well designed and thoroughly vetted,

typically provides a broader context to the food system. The CFL's broader look at food system topics was an inspiration during the development of this project and the resultant facilitator's guide draws heavily upon the CFL's work while zooming in on food system topics as they relate specifically to Georgia. What state-focused curriculum existent today in Georgia is designed to educate how to grow food as either a conventional farmer or as an organic grower through organizations such as the Future Farmers of America's Georgia chapter (Georgia FFA & Agriculture Education, 2016). Food consumer education does exist for elementary school age students via the Farm to School curriculum in many schools (Georgia Organics, 2016). However education about the food system in Georgia for high school aged students is non-existent and yet these students stand at the threshold of being the next decision-makers due to their own purchasing power as consumers and that they are at a period of their lives when they are developing the ability to apply logical reasoning and abstract concepts to their choices (Bissonnette & Contento, 2001). To this end, the research of Bissonnette & Contento suggests that food system education can provide adolescent learners with "a more conceptual understanding of the issues" while also affording them a "greater opportunity to examine psychosocial or affective factors such as their attitudes, self-identity, and sense of responsibility in terms of these issues" (Bissonnette & Contento, 2001, p. 81). Further, they note the need to prepare today's adolescent learners to be tomorrow's decisions-makers. Providing them with accurate, timely and applicable information about our food system from multiple avenues - from biotechnology to sustainable farming practices to the benefits of access to local foods, is essential in order to ensure they can weigh all options and carefully examine all sides of the issues (Bissonette & Contento, 2001).

CHAPTER 3.

METHODOLOGY

The methods section of this proposal outlines the process used to develop this facilitator's guide. Throughout the development of *Georgia Food System Sustainability: A Facilitator's Guide* (from this point forward referred to as *The Guide*) a number of guidelines were followed in order to ensure quality, rigor, and clarity.

1. Identification and use of existing resources that helped establish key ideas about the food system and helped build general background knowledge.
2. Establishment of the initial outline of the activities showcased in *The Guide* by using the Understanding by Design framework
3. Alignment of *The Guide* with the North American Association of Environmental Education's (NAAEE) *Guidelines for Excellence Series* in order to adhere to established standards of excellence of environmental education.
4. Review of each activity showcased in order to ensure they meet the Experiential Learning standards. The primary delivery method of the curriculum is through the experiential learning model.
5. Aggregated feedback from previous pilots of each activity showcased in *The Guide.*
6. Identification of opportunities for dissemination of *The Guide* into the greater Atlanta educational community.

Food System Background Resources

In an effort to help learners build basic background knowledge about food systems, two existing resources were used. The evidence based and comprehensive textbook *Introduction to*

the US Food System and the curriculum, *Teaching the Food System* (renamed *Foodspan*), were essential in providing background information during development (Neff, 2015; Foodspan, 2016). From these resources a general overview of the food system was provided in Section I of *The Guide* in order to help facilitator's understanding of the concepts being covered while also working towards a focus on Georgia's role within our food system. Both of these resources were developed by the Johns Hopkins Center for a Livable Future (CFL). The CFL was founded in 1996 and their work uses public health to contextualize issues around food communities, food policy, and food system sustainability. *Foodspan* curriculum is a free resource for teachers that provide an extension of the CFL's mission through specific classroom applications (Johns Hopkins University, 2016). This curriculum consists of three units focused on classroom learning through lesson plans, slides, and handouts and offers excellent background readings for a facilitator using *The Guide* as they educate their students about the basics of the food system. *Introduction to the US Food System* involved the work of over 100 experts in the field of food system and public health and provides a collegiate level investigation of food system topics from history, to production, to food equity, to nutrition and eating patterns (Neff, 2015). Topics are covered in this textbook in greater depth allowing a more thorough investigation of general food system topics.

Intended Audience and State Standards

The intended audience for this facilitator's guide is high school students within the Atlanta metropolitan area. High school students are preparing themselves to be the next major decision makers, developing skills such as logical reasoning and how to apply abstract concepts (Bissonnette & Contento, 2001). At the same time these young people are becoming

disconnected from their food system in terms of their understanding of its complexity as well as not developing the skills necessary to play an active role in its future (Bissonnette & Contento, 2001). Research suggests that while it may be difficult to foster a change in behavior of young learners through education, they should be offered knowledge for the future and provided new context through which to view our food system (Monroe, et al., 2015).

Throughout the design of *The Guide*, specific focus was given to its application in independent schools because of their flexibility and curricular independence, not afforded the more curricular regulated public schools in Georgia. The Georgia Independent School Association (GISA) provides a platform from which to connect *The Guide* to other independent schools throughout Atlanta and perhaps beyond.

It is important to note that while this curriculum was not developed for the public school system as a stand-alone course, there are a number of high school environmental science standards that align with the FFT framework. A number of state standards do not explicitly mention the food system; however they may be viewed through the context of food. At the same time there are a number of standards in which food is explicitly mentioned as a focus of students learning and *The Guide* could prove useful in helping public school educators meet those standards.

Sensitivity to Different Groups of Learners

While it has been previously argued that food system literacy is a priority, it is important to acknowledge that each of us may have our own beliefs, ideas, and ethics when it comes to food related issues and a certain level of sensitivity to topics associated with food must be maintained. Food can be such an intimate subject. It is connected to the individual, socio-

economics, racial heritage, and even cultural preparation and consumption, oftentimes referred to as “foodways”, of various ethnic and racial communities (Neff, 2015, p. 216). These circumstances should be given consideration in order for *The Guide* to be effective. The content of *The Guide* provides a broad enough context of the food system that anyone can engage with the topics presented. By doing so *The Guide* strives to adhere to key characteristic 1.4 of North American Association of Environmental Education’s *Environmental Education Materials: Guidelines for Excellence* which suggests a reflection of diversity that seeks to treat “different cultures, races, genders, social groups, ages, etc.” with “respect and equity” (NAAEE, 1998 p. 6).

Framework for this Facilitator’s Guide

The Guide is designed to help the facilitator design activities that take the learner through each step of the food supply chain in order to understand how each step works. A number of activities have been designed and included that offer the facilitator a way to begin the process. Most activities also include suggestions on ways to extend the activity should time and interest allow. Along the journey through the food system the learner explores resources (inputs) that are needed in order for each link of the chain to be successful as well as impacts (outputs) that each link can have upon others and the environment. Throughout the course of the journey other influences (drivers) of our food system are discussed. These drivers may be external to the supply chain itself, e.g. government food policy, however they are expressed throughout all aspects of the supply chain and shape the rest of the food system (Neff, 2015). Figure 1 provides a visual for how this process will look.

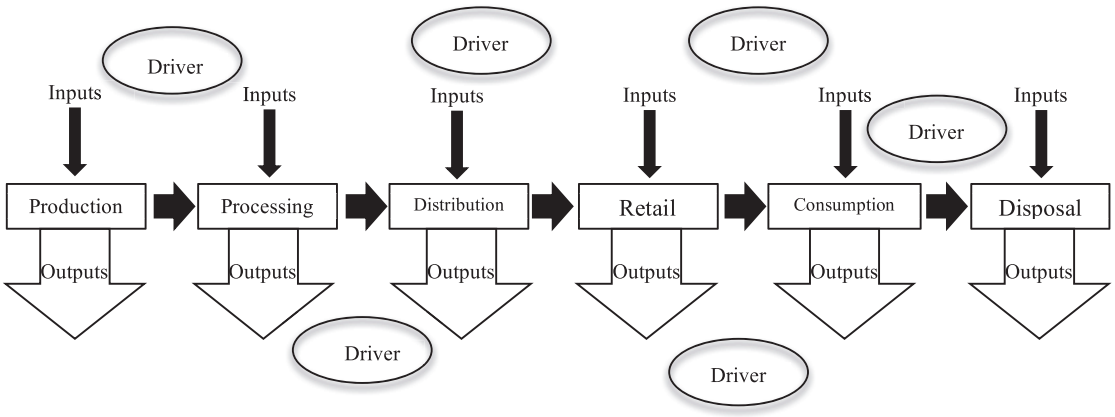


Figure 1- Food system diagram meant to provide visual framing for *The Guide's* activities.

The framework for the activities showcased in *The Guide* was developed using the tools of Understanding by Design (UbD) (Wiggins & McTighe, 2005). UbD seeks to help teachers design curriculum that avoids students developing formulaic knowledge and recall learning. *The Guide* establishes targets for students that consist of attainable information, or understandings, rather than simple facts that are memorized and only stick with them until the next big assessment (Wiggins & McTighe, 2005). Each activity found within *The Guide* includes a set of what Wiggins & McTighe (2005) called Essential Questions meant to help the learner make meaning of important ideas and in turn lead to the asking of other questions in order to further the learners understanding. The learning targets for the activities within *The Guide* have been further refined using the NAAEE's *Guidelines for Excellence* series. *The Guide* adheres to each of the six "key characteristics" outlined in NAAEE's *Environmental Education Materials: Guidelines for Excellence* which are, (1) Fairness and Accuracy; (2) Depth; (3) Emphasis on Skills Building; (4) Action Orientation; (5) Instructional Soundness; (6) Usability (Environmental Education, 1998, p.4).

Understanding by Design

Understanding by Design provides a template that was utilized while designing the activities found within *The Guide*. While not entirely prescriptive the UbD method allowed the developer the opportunity to clearly lay out each activity in *The Guide* in a clear and concise way. A goal of each activity was established and was meant to provide an overarching focus from which the activity, and its extensions, could derive meaning. This goal allowed for the development of "enduring understandings" and "essential questions" which Wiggins and McTighe define as "specific inferences that have lasting value beyond the classroom" and "a question that lies at the heart of a subject or a curriculum" respectively (Wiggins & McTighe, 2005, p. 342). These essential questions were designed so that they can be shared with the student and offer transparency to the learning experience as the student can clearly see what the purpose of the lesson(s) includes and what the teacher wants them to understand. Finally, each specific learning activity in *The Guide* was created.

The Guide seeks to address the overall goal of helping students understand that the production, processing, distribution, purchase, and disposal of food create an ever-evolving system that needs to be as sustainable as possible. Each of the learning activities designed for *The Guide* seek to address the strands laid out in the NAAEE's *Guidelines for Learning* for students at the 12th grade level as well including helping students gain "the basic skills and disposition they need to understand and act on environmental problems and issues" that are created by our food system and by "challenging learners to hone and apply problem-solving, analysis, persuasive communication, and other high level skills" within the real world context of our food system (NAAEE, 1999, p. 3).

Utilizing the Experiential Learning Cycle in Activity Design

The specific activities in *The Guide* are intended to be experiential as much as constraints allow. These activities are also intentionally designed to be centered on the subject, which is to the say the food system of Georgia and beyond. However as food is something we are all deeply connected to it can be argued that each activity is student centered as well since each activity the student will partake in can have a significantly different meaning to them than their peers.

Since his first book in 1984, *Experiential Learning: Experience as the Source of Learning and Development,* David Kolb has asserted that one must engage students in a concrete experience that connects directly with what they are trying to learn. Drawing upon the earlier work of John Dewey's "progressive" educational theories and pragmatism, the research of social psychologist Kurt Lewin, and Jean Piaget's work with childhood development, Kolb established an educational theory that includes this "concrete experience" as not just as a jumping off point but rather as an integral part of a cycle as shown in Figure 2 (Kolb, 1984, p. 4-15).

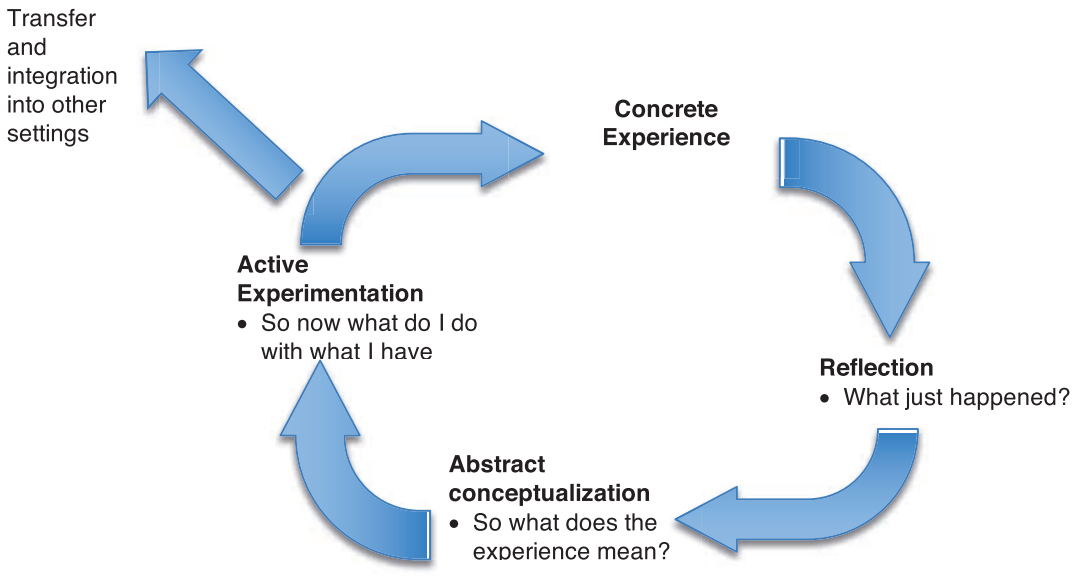


Figure 2- David Kolb's experiential learning cycle (1984)

By helping learners navigate their way through the experience, to reflect on what occurred, and to strive to internalize it in a way that is meaningful to them they will in turn be able to make better sense of their learning within the context of their own lives and will transfer this knowledge and understanding to later experiences.

Much of our food system is hidden to us as consumers. We go to the store or maybe a restaurant to acquire the food that will sustain us, however acquisition of that food is only part of the journey that the food has taken. Many of us, as consumers, never experience any other part of the food system aside from a very narrow window. Kolb's learning theory suggests that a well-crafted experience with appropriate reflection can help us gain a better grasp of what we are trying to learn. For this reason, *The Guide* is designed to provide an immersive experience for the learner that includes all stages of the food system and not just retail and consumerism.

In the city of Atlanta there are a number of resources available to ensure learners have the opportunity for a concrete experience. Urban farms around the city provide access to the production stage of the food system as well as expose learners to an understanding of the way these farms help mitigate issues of food insecurity. Atlanta is home to a number of processing facilities from Coca-Cola to Frito Lay, which gives learners a glimpse into how our food is handled before reaching store shelves. Whole Foods Market teaches students about the mission and values of their retail chain, describing ways they choose to source their food from suppliers as well as the packaging and labeling of food. The non-profit group, Georgia Organics, educates about the benefits and methods of composting food as a way to curtail food waste. Each of these organizations was utilized in design of this curriculum to provide the learner with a more concrete experience along each step of the food supply chain.

Curriculum Pilot Course

At the time of this writing the fourth year of a pilot course, utilizing ideas related to the activities found within *The Guide,* is in its planning stages. This course has been taught each spring semester since 2014 at The Westminster Schools in Atlanta, GA. The course, titled *Sustainability and the Food System*, is a one-half credit science elective for juniors and seniors. Support for this course from the school has been overwhelming since it was initially proposed. Interviews were conducted with school administrators to gain clarity into why they chose to support the pilot course from which this curriculum will be developed. Assistant Head of Schools, Jere Wells, commented on the experiential nature of the current course and felt that it is sometimes difficult to find curricula where there is an intersection of the content and a truly concrete experience such as one the topic of food can provide (J. Wells, personal communication, May 10, 2016). When asked about the ways in which the existing course fulfilled the mission and values of The Westminster Schools, Mr. Wells commented that the nature of the course brought it into alignment with the school's sustainability goals and that it offered students the chance to "problem find and problem solve" while working with the important topic of food (J. Wells, personal communication, May 10th, 2016).

The Westminster Schools has provided a laboratory in which the different activities for *The Guide* were developed, tried out, assessed, and retooled in an effort to see what sort of understanding students might take from them. Additionally, the design team conducted teacher professional development workshops for *The Guide*. The intention of these workshops was to gain an understanding of ways in which *The Guide* could be deliverable to teachers interested in

teaching about these topics without becoming overwhelming while at the same time being adaptable enough so teachers could explore the topics in their own way.

Conclusion

The Guide was developed based on the need to prepare high school students to become more informed consumers. This facilitator's guide will assist teachers as they encourage learners to think of themselves as part of the food system and help them understand how their decisions about the foods they choose matter to others and the environment in ways they may not have ever thought of before.

The activities found in *The Guide* were developed via Wiggins and McTighe's *Understanding by Design* design template in order to establish clear goals as well as specifically what it is that the learner should understand as they move through these activities. In order to help them reach these understandings a number of essential questions were developed that encourage the learner to think critically about the subject matter. Food is something that we partake in each day and have done so for the entirety of our lives and therefore is highly specialized to each individual. For this reason students are encouraged to think about how they specifically relate to food system topics found in *The Guide* and the essential questions provide students and teachers with an analytical starting point as they begin to explore the food system.

Specific activities designed for *The Guide* are intended to be experiential in nature. Attention was given to Kolb's experiential learning cycle as each activity in this curriculum was created (Kolb, 1984). By doing so the activities designed seek to immerse students in the food system as more than just a consumer. Students will experience as much of the food system as possible and specifically how their home state of Georgia plays an integral role in the food

system of our country as a whole. Reflection upon these topics will be critical in order to help students internalize material and make personal meaning.

In order to ensure proper rigor and quality of this curriculum the NAAEE's *Guideline for Excellence* series was utilized with specific attention given to the guidelines for environmental education materials, the guidelines for learning (K-12), and the guidelines for non-formal environmental education programs. These guidelines will ensure adherence to the best practices of environmental education for all components of the activities found in *The Guide*.

New ideas and research ensure that the topic food and how we acquire our food is dynamic and ever evolving. For this reason this *The Guide* was designed to evolve as well, however the overarching themes are meant to remain the same. The facts and figures related in each of the activities may not stay the same. That being said, the big idea of this curriculum - that production, processing, distribution, purchase, and disposal of food create an ever evolving system that needs to be as sustainable as possible - is always a constant and is meant to address the goals of environmental education as a whole.

REFERENCES

Atlanta Community Foodbank. (2013). Facts and stats. Retrieved from http://acfb.org/facts-stats

Berry, W. (2009). *Bringing it to the table: On farming and food*. Berkeley: Counterpoint.

Bissonnette, M. M., & Contento, I. R. (2001). Adolescents' perspectives and food choice behaviors in terms of the environmental impacts of food production practices: Application of a psychosocial model. *Journal of Nutrition Education, 33*(2), 72-82.

Buzby, J.C., Wells, H.F., & Hyman, J. (2014). The estimated amount, value, and calories of postharvest food losses at the retail and consumer levels in the United States. *United States Department of Agriculture Economic Research Service*. (Research Report No. 121). Retrieved from http://www.ers.usda.gov/media/1282296/eib121.pdf

Center for Agribusiness & Economic Development (Comp.) *2013 Georgia farm gate value report* (Research Report No. 14-01). (2014). Athens: The University of Georgia.

Coleman-Jensen, A., Rabbitt, M.P., Gregory, C., & Singh, A. (2015). Household food security in the United States in 2014. *United States Department of Agriculture Economic Research Services.* (Research Report No. 194). Retrieved from http://www.ers.usda.gov/media/1896841/err194.pdf

Federal Interagency Committee on Education, W. D. & Department of Health, E. D. (1978). Toward an action plan: A report on the intergovernmental conference on environmental education. A Paper Developed by the Subcommittee on Environmental Education. Retrieved from http://eric.ed.gov/?id=ED155063

Furman, C., Roncoli, C., Nelson, D. R., & Hoogenboom, G. (2014). Growing food, growing a movement: Climate adaptation and civic agriculture in the southeastern United States. *Agriculture and Human Values, 31*(1), 69-82.

Georgia Department of Community Affairs. (2005). *Georgia statewide waste characterization study*. Retrieved from

Georgia Farm Bureau. (n.d.). Agriculture: Georgia's $74 billion industry. Retrieved from http://www.gfb.org/aboutus/georgia_agriculture.html

Georgia FFA & Agriculture Education. (2016). Curriculum. Retrieved from http://www.gaaged.org/curriculum/

Georgia Organics. (2016). Farm to school in Georgia. Retrieved from https://georgiaorganics.org/for-schools/farm-to-school-in-georgia

Gunderson, C., Satoh, A., Dewey, A., Kato, M., & Engelhard, E. (2015). *Map the meal gap 2015: Overall food insecurity in Georgia by county in 2014*. Retrieved from http://www.feedingamerica.org/hunger-in-america/our-research/map-the-meal-gap/2014/GA_AllCounties_CDs_MMG_2014.pdf

Hall, K. D., Guo, J., Dore, M., & Chow, C. C. (2009). The progressive increase of food waste in America and its environmental impact. *PLoS One, 4*(11) doi:http://0-dx.doi.org.library.acaweb.org/10.1371/journal.pone.0007940

Hesterman, O. B. (2011). *Fair Food*. New York: PublicAffairs.

International Food Information Council Foundation. (2015, July). What's your health worth? [PowerPoint slides]. Retrieved from

http://www.foodinsight.org/sites/default/files/2015%20Food%20and%20Health%20Survey%20-%20FINAL.pdf

Johns Hopkins University. (2016). Foodspan. Retrieved September 4, 2016, from Johns Hopkins Center for a Livable Future website: http://foodspanlearning.org/

Kane, S.P., Wolfe, K., Jones, M., & McKissick, J. (Comps.). (2010, May). *The local food impact: What if Georgians at Georgia produce?* (Research Report No. CR-10-03). Athens, GA: Center of Agribusiness and Economic Development.

Kolb, D. (1984). *Experiential learning: Experience as the source of learning and development.* Englewood Cliffs: Prentice Hall.

Leib, E. B., Rice, C., Neff, R., Spiker, M., Schklair, A., & Greenberg, S. (2016, May). *Consumer perceptions of date labels: National survey*. Retrieved from http://www.chlpi.org/wp-content/uploads/2013/12/Consumer-Perceptions-on-Date-Labels_May-2016.pdf

Low, S.A., Adalja, A., Beaulieu, E., Key, N., Martinez, S., Melton, A., Perez, A., Ralston, K., Steward, H., Suttles, H., Vogel, S., & Jablonski, B.B.R. (2015) Trends in US local and regional food systems. *United States Department of Agriculture Economic Research Service.* (Publication No. 068). Retrieved from http://www.ers.usda.gov/media/1763057/ap068.pdf

Lyson, T. A. (2004). *Civic agriculture: Reconnecting farm, food, and community*. Lebanon: Tufts University Press.

Monroe, J. T., Lofgren, I. E., Sartini, B. L., & Greene, G. W. (2015). The green eating project: Web based intervention to promote environmentally conscious eating behaviours in US

university students. *Public Health Nutrition, 18*(13), 2368-2378. Retrieved from http://dx.doi.org/10.1017/S1368980015002396

National Peanut Board. (2016, February 11). Peanut country, USA. Retrieved from http://nationalpeanutboard.org/the-facts/peanut-country-u-s-a/

Neff, R. (Ed.). (2015). *Introduction to the US food system: Public health, environment, and equity*. San Francisco: Jossey-Bass.

North American Association for Environmental Education (2010). Excellence in Environmental Education: Guidelines for Learning (K-12). Retrieved from http://resources.spaces3.com/47edc444-7bd4-4093-918b-7964644cce75.pdf

North American Association of Environmental Education. (n.d.). History of EE: Some helpful documents. Retrieved from https://naaee.org/eepro/resources/history-ee-some-helpful-documents

Pew Campaign to Reform Industrial Animal Agriculture (Comp.) (2011). *Big chicken: Pollution and industrial poultry production in America*. The Pew Environment Group.

Pollan, M. (2006, May 7). Voting with your fork. *The New York Times*, Opinion pages. Retrieved from http://pollan.blogs.nytimes.com/2006/05/07/voting-with-your-fork/

Sarukhan, J., & Whyte, A. (Eds.). (2005). *Ecosystems and human well-being: Synthesis*. Washington: Island Press.

Spence, M., Annez, P. C., & Buckley, R. M. (2009). *Urbanization and growth*. Washington, DC: Commission on Growth and Development. Retrieved from

http://www.dca.ga.gov/development/environmentalmanagement/publications/georgiamswcharacterizationstudy.pdf

Sundkvist, A., Milestad, R., & Janssonc, A. (2005). On the importance of tightening feedback loops for sustainable development of food systems. *Food Policy*, *30*(2), 224-239.

Svenfelt, A., & Carlsson-Kanyama, A. (2010). Farmer's markets: Linking food consumption and the ecology of food production? *Local Environment*, *15*(5), 453-465.

Tansey, G. (1994). Food policy in a changing food system. *British Food Journal*, *96*(8), 4.

Truly Living Well Center for Natural Urban Agriculture. (2013). About TLW. Retrieved from http://www.trulylivingwell.net/about-us/

UNESCO (1975). The Belgrade charter. International Workshop on Environmental Education, Belgrade, Yugoslavia, 3-22.

Union of Concerned Scientists. (n.d.). Hidden costs of industrial agriculture. Retrieved from http://www.ucsusa.org/food_and_agriculture/our-failing-food-system/ industrial-agriculture/hidden-costs-of-industrial.html#.V06nrqgrLVp

United States Census Bureau. (n.d.). U.S. and world population clock. Retrieved from http://www.census.gov/popclock/

United States Department of Agriculture. (2015). 2015 state agriculture overview: Georgia. Retrieved from: http://www.nass.usda.gov/Quick_Stats/Ag_Overview/stateOverview.php?state=georgia

What is sustainable agriculture? (2010). Washington: Sustainable Agriculture Research and Education.

Wiggins, G. P., & McTighe, J. (2005). *Understanding by design* (2nd ed.). Alexandria: Association for Supervision and Curriculum Development.

APPENDIX A

FACILITATOR'S GUIDE

Georgia Food System Sustainability

A Facilitator's Guide

By Joey Jarrell

For use by Georgia High School teachers

Created: 2016

ACKNOWLEDGMENTS

The completion of this facilitator's guide would not have been possible without the professional support of The Westminster Schools in Atlanta, Georgia. I sincerely thank the Center for Teaching at Westminster for their wealth of resources as well as the faculty and staff from Westminster who have supported this project. I also wish to think Dr. Dottie Shuman and Dr. Brad Daniel for their support and patience with me as I waded through the long development process of this project. Dr. Shuman's diligence and understanding of my work was crucial in ensuring its success. I would also like to thank all my family, including Jake Horne for his masterful editing skills, and especially my son Bennett who always reminds me to be humble and patient. Lastly, I give the biggest praise to my wife Emily whose support of me extends beyond simple words of encouragement. Emily is a true co-author of this project and many of her ideas provide the backbone for what can be found within its pages. Without her, my partner in crime on this project, I never would have made it through.

Introduction

Pop quiz. Think back to your most recent meal.

- What did you have?
- Did you consume that meal alone or in the company of others?
- How many ingredients were included in that meal?
- How much did your meal cost?
- What percentage of the food you had for that meal was raised in Georgia?
- Did you clean your plate or did you have some leftovers?

While food is, typically, ubiquitous for most of us we rarely give consideration to all of these sorts of questions each time we sit down to eat. Full and busy lives means we don't have the time or interest to be quite so analytical each time we eat a meal. Consider, as well, the fact that many of us don't consume meals in the traditional sense of breakfast, lunch, and dinner but rather smaller meals and snacks throughout the day.
This guide is meant to provide you with a number of ideas about how, and why, we should teach about the food which each of us needs for vital nourishment and the system through which that food is produced and travels. It is our hope that you have picked this guide up because you have some interest in teaching your student's about their choices when it comes to food and how those choices can have unseen impacts on the world around us.

How to use this facilitator's guide
This guide is the culmination of years of teaching about the food system with specific attention to the food system of Georgia. The food system is constantly evolving though and for that reason you may find new innovations as it relates to the food system may now be in play. For that reason it is important to note that this guide is not intended to be your only source of information as a facilitator. If you feel as if you personally need some more background knowledge about our food system we encourage you to begin with exploring the resources provided in the appendix.

The first section of this facilitator's guide provides a framework as well as some considerations you may want to think about when **planning** a curriculum focused on the food system in Georgia. As you begin the process of developing ideas, identifying resources, and establishing outcomes there are a wealth of educational tools available

The second section of this facilitator's guide provides you with specific activities that you can use to begin **implementing** a curriculum focused on the food system in Georgia. It is feasible to use these activities alone to provide your students with some basics about the food system of Georgia. However we encourage you to dig a bit deeper as interest and your time allows. There are so many fascinating opportunities for learning once we begin to unpack our food system that can provide a unique educational experience for you and your students.

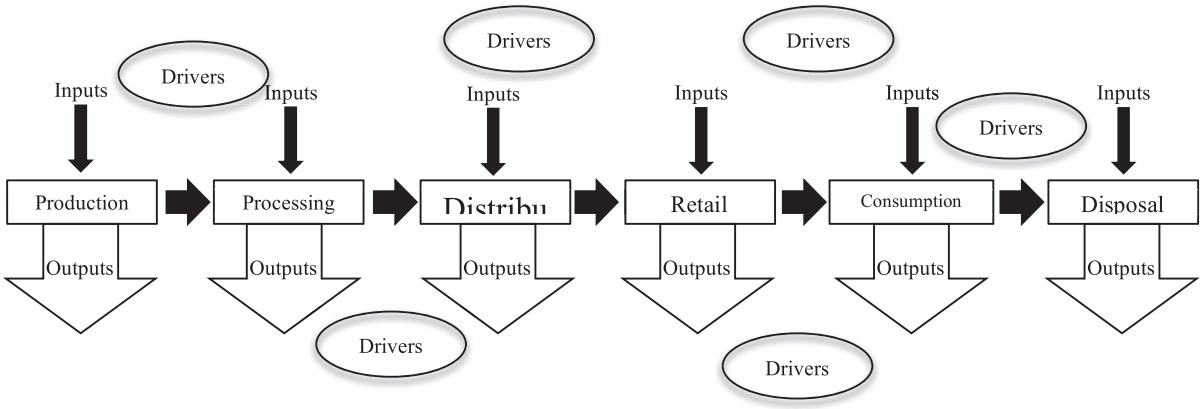
Section I

What is the food system?
For most Americans, each time we sit down for a meal we are taking place in a wonderful pageantry that began on some distant farm field, continued through a processing facility, took time to travel by land, sea, and perhaps air, and finally arrived in our own kitchen or favorite restaurant. This trip from a farm to your plate is referred to as the **supply chain.** Whether we realize it or not the food we consume has had quite a journey and has required a great deal of effort even if it came from our very own backyard garden. Along that journey the steps through which our food is created has had a wealth of impacts on the lives of others as well as the environment as a whole. These steps, the **inputs** that they require, and the **outputs** they impart are referred to as our food system.

There are also things that influence our food system that lie outside of the normal day to day operation of getting food from the farm to your plate. This may include an array of different things such as governmental food policies, people's personal food preferences, or even the newest diet trend. This could also include seemingly unrelated topics like urbanization of our cities, environmental issues such as climate change, or new technology breakthroughs. All of these things are considered **drivers** of the food system and manipulate the way in which the overall food system works.

Throughout the course of this guide the diagram below will serve as the road map to help you, the facilitator, understand the path that our food takes. It includes the **supply chain** along which our food travels to get to our plate as well as the **inputs, outputs,** and **drivers** along the way.

Be warned though that this road map is intended to be a simplified version of the process that allows you and your students the opportunity to get on board with studying the food system. This diagram is great if you were tracking something like a single tomato but what happens when that single tomato is turned into pasta sauce or ketchup? Suddenly the whole system becomes more complicated. <u>However, have no fear!</u> By beginning with this pared down version of the food system both you and your students are afforded the chance to begin an exploration into your food system that will hopefully begin your own journey toward a greater literacy about the food that you eat.



Why teach about the food system?
The way our food is produced can have many different permutations. These are viewed as alternative farming systems within our overall food system. For example do we choose to buy food that is produced through conventional agriculture with its heavy reliance on inputs such as synthetic fertilizers and pesticides or do we choose food that is produced through organic means, which purposely avoids these inputs but may come with a higher price tag?

Regardless of the way in which we acquire our food the impacts that our food system can impart are oftentimes not acknowledged. Many of us want to eat food that is affordable and healthy for us and for our families but what about food that is healthy for our environment as well? What about food that is safe for the environment but that which your family cannot afford? Throughout the course of this guide we want you, the facilitator, to think critically about what it means for the choices we make about our food and the fact that that food should be as sustainable as possible. The activities provided in this guide strive to view sustainability through three different contexts.

> Sustainability in this facilitator's guide is defined as the ability of our food system to produce all the food that is needed for everyone on the planet while supporting ecological balance and ensuring prosperity for future generations.

Economic sustainability - Exploring the food system is, at its root, an exploration of what it means to be a consumer. Therefore the food system is inextricably linked to consumption of goods and economics as well. We need to ensure we have the financial means to be able to put food on our family's table. At the same time an economically sustainable food system ensures that anyone else involved with putting that food on your table is provided with the financial means to effectively do their job.
Examples of topics to be explored that address the economic sustainability of our food system:

- The cost of organic and/or local food vs. the cost of traditional agriculture.
- The economic benefits of new technologies in our food such as genetically modified organisms.
- Low income families and access to federal food assistance programs.

Social sustainability - We want to be sure we are eating as healthy as we possibly can so that our bodies receive the most nutrition from our food. Ensuring the sustainability of our food in this context means that we have adequate nutrition for our loved ones and ourselves. However it also means examining how fair and equitable is food for others within our social construct. Food that is socially sustainable is food that allows for the proper ethical treatment of those working within the food system and it allows for equal access for everyone to healthy and clean food.
Examples of topics you may want to explore that address the social sustainability of our food system include.

- Food labels and what they tell us about the healthfulness of our food.
- How food marketing affects families eating habits.

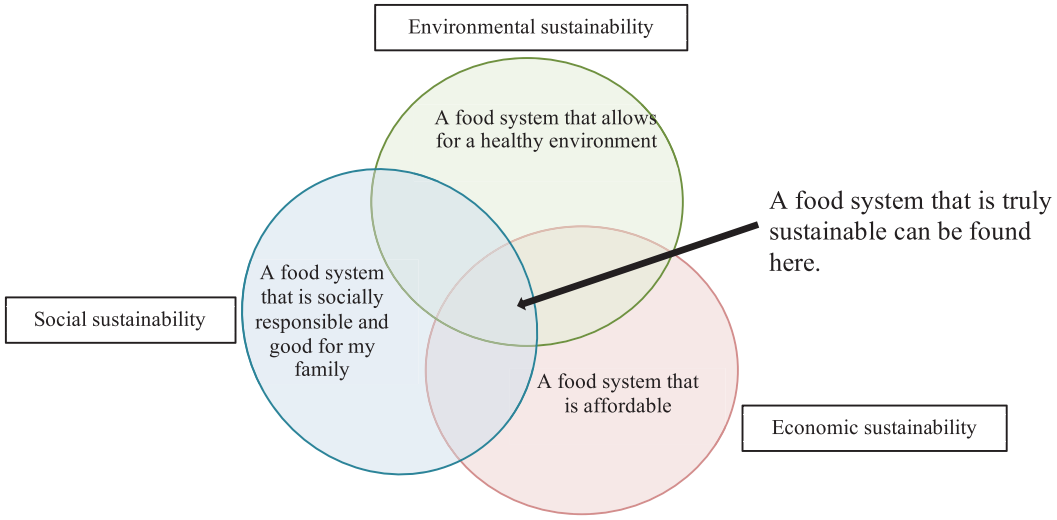
- Methods of ensuring everyone has access to food (oftentimes referred to as food justice).
- Ethical treatment of migrant workers on the farm.

Environmental sustainability - The impact upon our environment from raising enough food to feed the world can seem like a daunting task. Environmental impacts from food production can be some of the most costly to the future of our planet. Since many of those impacts are happening outside our immediate view we oftentimes remain unaware of the effects of our choices. Food that is environmentally sustainable seeks to mitigate these issues.

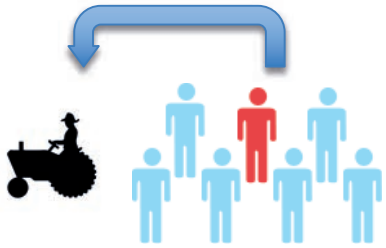
Examples of topics that you could cover with your students that address the environmental sustainability of our food system

- Local food vs. organic food and which one has the least environmental impact.
- The wastefulness of our food system and how we as consumers drive this issue of waste.
- Reintroducing old farming techniques in order to decrease the amount of fossil fuel derived inputs required to raise our food.

We encourage you, as the facilitator, to look for the harmonious balance between these three contexts when teaching about a sustainable food system. When discussing our food system, none of these should take precedent over another but rather we should strive for an equal intersection of all three as shown in the diagram below.



Why teach about the food system of GA?
Agriculture is one of the Georgia's oldest and largest industries and this long and storied history has led to the food system that has become one of the most common ways that Georgians make a living. One in seven Georgians works in agriculture, forestry, or related fields.



Georgia's farms and farm workers lead the way in national production of many things from chickens to peanuts to blueberries and pecans. Food processing in Georgia is an $11.5 billion industry with companies such as Southern States farming coop, Coca-Cola bottling, and Pilgrims Pride (the nations leading chicken producer) all doing a wealth of business in the state.

At the same time Georgia's food system is evolving. Some highlights:

- From 2003-2013 the state saw an 1117% increase in the number of farmers markets around Georgia. Farmers markets provide the consumer with the opportunity to see the face behind the production of their food.
- The Georgia state Department of Agriculture has developed a marketing and economic development program called Georgia Grown with the intention of bringing consumers closer together with their food system.
- In 2015 the office of the mayor of the city of Atlanta hired its first Urban Agriculture Director with the intent of bringing local food to within ten minutes of 75% of all Atlanta residents by 2020.
- Many new and existing Atlanta restaurants have begun to embrace the growing farm to table movement by sourcing sustainably grown/raised and local foods.

Why teach the food system to High School students?
High school students are preparing themselves to be the next major decision makers while developing skills such as logical reasoning. The ability to apply abstract concepts is important as many food systems related topics are abstract in the sense that they are not readily present when we sit down to a meal. Research has shown that young people are becoming disconnected from their food system in terms of their understanding of its complexity as well as the skills necessary to play an active role in its future (Bissonnette & Contento, 2001). It has been suggested though that while it may be difficult to foster a change in behavior of young learners, through education, they are offered knowledge for the future and provided new context through which to view our food system (Monroe, et al., 2015).

Getting started

Teaching about the food system can be a worthwhile endeavor but first you need to ask yourself, why do I want to teach about this topic? We suggest that you first consider this question. The following steps will also help you get started with the process of answering this important question before moving towards implementation.

Step #1: Identify the specific food system issues you want to address with your teaching.

Through the activities provided in this facilitators guide you will begin to explore some of the issues involved with the food system both in Georgia and beyond. It is important to decide what specific topics you would like to focus on. It is beyond the scope and depth of this facilitator's guide to cover all issues related to our food system. There are yearlong college level courses dedicated to a very detailed exploration into the food system. The activities provided into this guide are intended to instead be a beginning point for high school students. Choose the topic(s) that you feel will be of most interest to your students (example - organic vs. conventional agriculture OR an audit of your food waste) and focus your energy where the experience will be most impactful. Each example activity in Section II includes an opportunity for extension if you want to go further with the concepts.

We suggest you take into consideration the fact that food related topics are always evolving and we encourage you to go beyond the activities in this guide by exploring the resources provided in the appendix to continue to expand your own understanding of the issues surrounding food.

Step #2: Decide how you would like to incorporate the food system into your classroom.

It is important to identify how much class time you are willing to commit to teaching about the food system. Whether you are hoping to tie this to your existing course or curriculum or create something far more intensive (possibly a semester long exploration of all things food???), you will need to identify how it fits into your overall plan for the school year.

Many of the activities in this guide view an exploration of the food system through the perspective of a science classroom. However teaching about the food system can easily be incorporated into any existing course if you get a little creative. Check out the extensions section of the activities provided for ideas on how to incorporate your exploration of the food system into other subjects.

Step #3: Establish the outcomes are you hoping to get from your students.

By helping your students gain knowledge about their food system you are taking critical steps in helping them understand something that many of us take for granted. Each of the activities in this guide includes objectives for assessing how well your students are grasping the content. It is important to decide, though, just how far you want your students to take their new knowledge and understanding. Do you want them to become a more critically minded consumer in the future? Do you want them to work towards an action plan that involves becoming an active citizen in the food system? Define these outcomes

ahead of time so that you, and your students, can more clearly understand the journey you will be taking.

Step #4: Identify your institutional food related resources.
There is no better way to begin to connect students to the topic of food systems than to catch them while they are eating. The experience of consuming a meal and then reflecting upon that meal is an important idea of this facilitator's guide. Where do your students access food on your campus? Is there a connection there that can be made to your teaching? The school cafeteria or snack bar may be options. What about the vending machine? Do your student have the opportunity to leave school at lunchtime to access their food? A school garden can become a critical resource for helping students gain better insight into the production side of the food system.
Is it possible to access your schools waste stream? This too can provide excellent insight for students into the oftentimes forgotten final stage of our food system. We suggest exploring your institutions connection to food in any way that you can. By doing so you offer your students the chance to see their educational community through a different lens.

Step #5: Identify food related resources off campus.
In the city of Atlanta there exists a wealth of resources you can utilize in teaching about the food system. Being a major metro hub of commerce in the southeastern United States means there are a number of industries focused on supporting Georgia's food system throughout our state and beyond. From corporate headquarters to food processing facilities and distribution centers, many components of the food system are available to explore. There is also a bountiful number of community gardens and urban farms that can be found around town that provide a glimpse into the important work of growing produce, oftentimes for communities in dire need of access to healthier food options. Farmers markets can be found any day of the week throughout Atlanta and provide the opportunity for students to interact and get to know the people who are producing food. Local non-profits such as Georgia Organics and the Atlanta Local Food Initiative work hard to advocate and educate about more local approaches to the food system. Utilizing these off campus resources will allow your students to connect to the food in their city and their state in a more impactful way.

Step #6: Assess your students understanding of the food system
Are your students grasping the food system concepts you identified in step #1? Are they gaining knowledge and understanding of those concepts? Are they engaged and thirsty for more?

In addition to delivering new concepts and ideas, the activities presented in this guide are focused on getting students to be more critically-minded consumers. Students are encouraged to use higher level thinking processes such as identifying bias in the food system, inferring from information provided, relating like concepts, applying their knowledge, and reflecting upon what they have learned. How is their skill set developing as they learn about the food system?

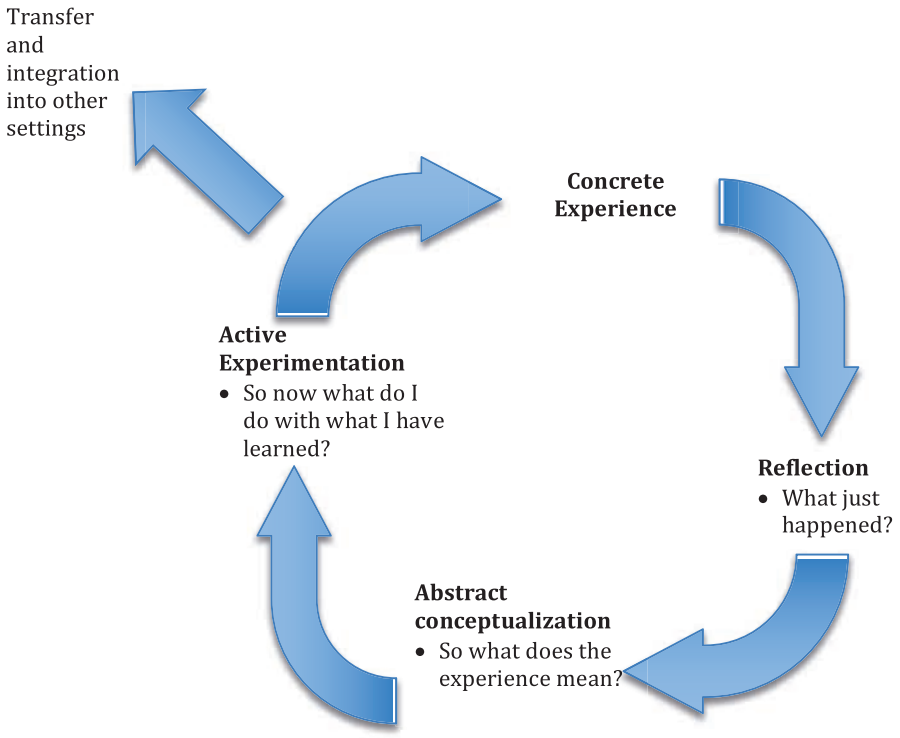
A discussion about appropriate assessment strategies is beyond the scope of this facilitator's guide. We encourage you utilize the assessment strategies that you are most comfortable with to ensure your students are thinking critically about their food. Each activity in this guide includes two to three measureable objectives to get you started.

Experiential learning and the food system

Rather than having a student sit in a classroom, listening and taking notes while their teacher lectures to them about food, the specific activities in this facilitator's guide are intended to be as experiential for the learner as possible. The concrete experiences provided by these activities should also include an opportunity to reflect upon what occurred during that activity in order to make meaning of that experience. These activities are also intended to be centered on the subject, which is to the say the food system of Georgia and beyond. However as food is something we are all deeply connected to it can be argued that each activity students will partake in can have a significantly different meaning to them than their peers.

Utilizing the experiential learning cycle to teach about food.

Since his first book in 1984, *Experiential Learning: Experience as the Source of Learning and Development,* educational theorist David Kolb has asserted that one must engage students in a concrete experience that connects directly with what they are trying to learn. Drawing upon the earlier work of John Dewey's "progressive" educational theories and pragmatism, the research of social psychologist Kurt Lewin, and clinical psychologist Jean Piaget's work with childhood development, Kolb established an educational theory that includes this "concrete experience" as not just as a jumping off point but rather as an integral part of a cycle as shown in the figure below.



Retrieved from *Experiential learning: Experience as the source of learning and development*. Kolb (1984)

By helping learners navigate their way through the experience, to reflect on what occurred, and to strive to internalize it in a way that is meaningful to them they will in turn be able to make better sense of their learning within the context of their own lives and will transfer this knowledge and understanding to later experiences.

Much of our food system is hidden to us as consumers. We go to the store or maybe a restaurant to acquire the food that will sustain us however this acquisition of that food is only part of the journey that the food has taken. Many of us, as consumers, never experience any other part of the food system aside from a very narrow window. Kolb's learning theory suggests that a well-crafted experience with appropriate reflection can help us gain a better grasp of what we are trying to learn. For this reason, the activities found in this facilitator's guide are designed to provide an immersive experience for the learner that includes all stages of the food system and not just retail and consumerism.

Sensitivity while teaching the food system

No two students have the exact same relationship to their food and how our students relate to food must be considered when educating them about this topic. Food is a tangible thing. It is real and present in each of our everyday lives and for that reason a student's literacy in regards to food topics is the culmination of a lifetime of eating. The opinions we have about food can be based as much in our own psychology as in an understanding of factual evidence about the food system. Your students are already pre-loaded with certain biases when it comes to food as well as some understanding and knowledge about food issues, perhaps correct perhaps not, that you will have to help them unpack. As a food system educator you may be trying to present information to your student that is contradictory to what they have thought to be true and in turn may be difficult for them to accept.

It is important to remember that food is an intimate subject. It is connected to the individual, socio-economics, racial heritage, and even cultural preparation and consumption, oftentimes referred to as "foodways", of various ethic and racial communities. Some activities provided in this facilitator's guide will help you understand where your students are coming from and, perhaps even more importantly, help your students put words to paper about where they themselves are coming from too.

Section II

Structure of these activities

Each activity included with this guide has been adapted from existing resources with a particular focus on the food system of the state of Georgia. The purpose of each activity is to provide you with a basic framework on how you can begin to teach your students about the food system. If you use each of these activities in order from start to finish you will provide your learners with a basic exploration of the food system here in Georgia. However, we encourage you to not confine yourself or your teaching to this linear progression if it doesn't work for you and your students. Take the time to define the goals that you have for teaching about the food system. Then choose the activity or activities most appropriate. Each activity also includes an opportunity for extension in case you want to go a bit deeper with that particular portion of the food system. Additional resources, found in the appendix, offer you the opportunity to begin to craft your own activities, lesson plan, and extensions as well.

Background readings

While there exists a wealth of background information available to you as you prepare to teach about the food system, it is important to identify those that provide the most well structured and designed approach for your students. The Center for a Livable Future (CLF) at Johns Hopkins University has created a number of fantastic resources and we suggest you may want to use their work to help your students with background information to compliment the activities provided in this facilitators guide as well as those activities that you may design yourself.

Activities provided in this guide include a link to the corresponding reading from the CLF's Food System Primer webpage (http://www.foodsystemprimer.org/). Each reading contains a wealth of general information about each of the different stages of the food system as well as a number of other food system related topics. We encourage the use of these fantastic readings in order to help your students understand the basic concepts when studying the food system.

Food system primer topics include:

- The Food System
- Food Production
- Food Distribution
- Food Processing
- Food & Nutrition
- Food Safety
- Wasted Food
- Food Policies
- Food Marketing and Labeling
- Hunger and Food Security

Activities and skill building

Each activity, in addition to imparting new knowledge, is intended to help students develop specific skills related to exploring the food system.

Investigate: Each activity provides the opportunity for students to learn new information about their food while gathering data and other evidence that provides them a more clear picture of their food system.
Analyze: Students will examine data in order to help them establish trends within the food system.
Evaluate: With the new information that they have learned students will think critically about their own preconceived notions and biases about food. Students are also encouraged to use critical thought to evaluate the sustainability of our conventional food system and its alternatives.
Act: Most of the activities in this guide could be extended into an action plan based project. By doing so students are provided the opportunity to connect with their larger community outside of the classroom (their family, school, city, state, etc.) and begin to explore ways in which they can make a difference even if its just with their own shopping dollars.

Sample activities for teaching the food system

The activities in this section of the facilitators guide are meant to provide an interactive and experiential approach to learning about the food system. Georgia's food system takes center stage for many of the activities as well.

We encourage usage of the background readings provided for students at the end of most activities as well as utilizing the extensive resource list provided.

Sample activities included in this facilitator's guide.

The first two activities are meant to provide an overview of food systems and explore student's ideas about food.

Exploring your Food Ethic
Digging Into the Supply Chain

How Does It Grow?
Mapping our food
Processed Food: The Whole Story
Packaging Detectives
Marketing and Labeling Memory
Grocery Store Lab
Curbing Food Waste: An Action Plan

These activities are intended to provide an in-depth exploration of one part of the food system.

Exploring your Food Ethic

Background:
Food can hold many different meanings to people. A person's history with food and the act of eating shapes their ideas about what food is, from satisfying basic nutritional needs to far more complex rituals involving major life events, family, and culture. By having your students actively consider what purpose food serves in their lives you are afforded a jumping off point in understanding what sorts of diverse views and opinions they bring to the table.

Purpose:
This activity encourages participants to be deliberate in thinking about what food means to them and what exactly food should be for each of us. If done at the beginning of your journey through the food system and then again at the end, this activity provides a great opportunity for a basic pre-assessment and post-assessment of your students ideas.

Objectives:
Students will:

- Clearly define their personal food ethic
- Reflect upon the food ethic of their classmates and examine how they may be either similar or different.
- Revisit their food ethic at a later date after a further exploration of the food system to compare and contrast how their food ethic may have changed.

Essential questions:

- Why do we choose to eat certain foods?
- In what ways could my food choices be influenced by other people or other things(ex. family, tradition, marketing and advertising, etc.)?
- What types of similar/dissimilar ideas about food do I share with my peers?

Materials:
Prompt (see framing section below)
Note card/paper/pen

Framing:
As we try to establish what sorts of moral beliefs we apply to our own eating consider the following questions.

A food ethic in this facilitator's guide is defined as a set of moral beliefs that affirm why you choose to consume certain foods.

- What does eating food mean to you?
- What emotions and ideas does eating food invoke?
- What value does food have to you?
- Where do you think these values come from?

Procedure:
Facilitator's note: Before you begin you may choose to share with students an example of what a food ethic may consist of, ex. "Food should be healthy and abundant". Be careful though as providing too specific of examples prior to the activity may overtly influence their brainstorming and creative process.

1. Brainstorm with students a list of adjectives for how they describe food (ex. fresh, hot, tasty, etc.).
2. Introduce students to the definition of food ethic and additional framing questions listed above.
3. Allow students personal time to reflect on their ideas to the prompts provided above and be thoughtful with their responses. Students should write out their personal food ethic in complete sentences.
4. Provide students the opportunity to share their food ethic they have created with the entire class.
5. Listen for key words representative of each student's food ethic.
6. Draw connections between common words and phrases.

Opportunity for extension
After further exploration of the food system you may choose to revisit the food ethic with the students using similar prompts to those provided in the framing portion of this activity. Encourage students to think about how their food ethic may have changed.
Prompt examples:

- What value does food have to you?
- Has it changed this semester? If so how? why?
- If it has not, why has it stayed the same?

Facilitator's note: Words can be submitted and used in a Wordle document to visualize trends in student's ideas about food. There are a number of Wordle generators available online (ex. http://www.wordle.net/). Comparing the Wordle from the first time you complete this activity and then again if you choose to revisit this activity can provide a visual representation the change in ideas.

Example Student Prompt
Right down all the adjectives that describe what you think food should be.

Once students have aggregated a list of adjectives you can plug these words into Wordle. Words that occur more than once should be written more than once. Below is an example Wordle for the prompt provided above.

Digging into the Supply Chain

Background:
As our food moves from the farm, the pasture, the ocean, or wherever else it may be produced it travels lots of miles and is affected by many people. Sometimes that trip is invisible to us on the other far end of things as consumers. This activity provides an overview of what it takes to get our food to us and encourages transparency by exploring a single food item throughout its food system journey.

Purpose:
Through self-guided research student are afforded the opportunity to delve into the food supply chain. By examining one stage deeply students have the chance to understand the complicated nature of that stage by itself before fitting that stage into the larger supply chain.

Objectives:
Students will:

- Utilize research to design a script and skit that informs the class about one stage of the food supply chain.
- Perform their skit along with other groups in order to examine how their stage of the supply chain fits into the supply chain as a whole.

Facilitator note: This activity is possible with any (one) food item you would like your class to learn about. However if you do not have a lot of time for research the ***supply chain activity cards*** *are available in the appendix. These cards focus on the journey of Georgia's number one cash crop, chickens.*

Materials:

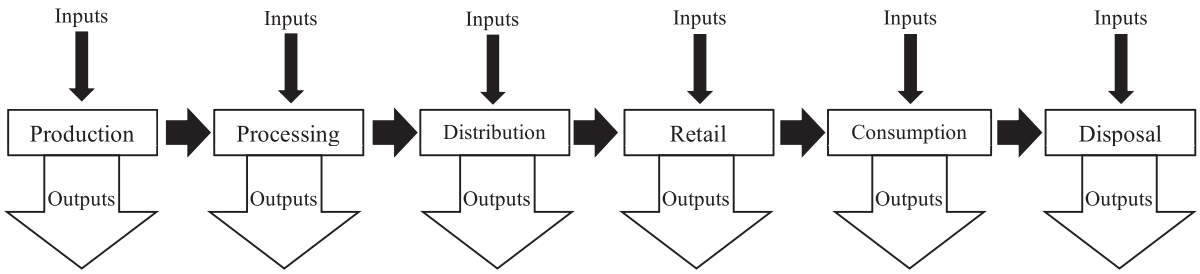
- Food supply chain stages and definitions (provided at the end of this activity).
- Computers and resource sites (see resources section of facilitators guide).
- Costume props for each stage. (optional)

Essential questions:

- What type of journey does food take from where it is produced to when it arrives on my plate?
- How is food connected to the economy, my health, and the health of the environment?

Framing:
Think about the last time you walked through a grocery store with aisle upon aisle of wonderful food just waiting to be eaten. Where does all that food come from and who handles it before it gets to you? In this activity you will be exploring that journey and how that fits into the overall food system through which every single one of those grocery store items must travel. You will get the chance to research and get creative with what each

stage might entail for one food item. In order to visualize the food supply chain you may want to use the diagram below



Procedure:

- Brainstorm with students what each part of the diagram above involves including each stage as well as what things, aside from the food item being research, goes into each stage (inputs) and what comes out of each stage (outputs). You may choose to use supply chain stage prompts found at the end of this activity.
- Group students and assign each group one stage of the supply chain.
- Provide students with a single food item they will be researching. Its best to choose a minimally processed food so students do not have to research multiple ingredients. Provide students with the opportunity to explore their stage further by using available research tools. Sending students off on the right foot will be important, so make sure to share a few sites with the students to give them a head start.
- Student groups will need to clearly articulate the supply stage chain they are representing. After presenting the assignment to students they will have till the end of class to come to work on script and skit.
- (Optional) Provide props and costumes to go along with their skit.
- Ask students to line up in supply chain order and share the information about their stage.
- Help students draw connections with the movement of the food product from one stage to the next.

Notes for students:

1. Students need to work together to explore the stage.
2. Students will be assessed on:
   a. Clarity and detail of their stage
   b. Collaboration: students work together and grade each other on participation
   c. Completion of assignment

Extension:

Once students understand what each stage of the supply chain entail you may choose to have them utilize their skit teach others.

Framing:

One of the best ways to learn and retain information is to teach it to someone else. Utilizing the knowledge gained from the **Supply Chain Activity** students will teach the way our supply chain works to someone younger than them.

Purpose:
This option may provide the opportunity for assessment to see how well your students grasp the supply chain. Students are assigned a section of the supply chain and a grade level (elementary-middle school that you choose) that they will later teach. After a thorough exploration of the supply chain (including completion of the procedures in the main portion of this activity) students will then be responsible for performing their skit for other students in a way that is age appropriate and educational.

Notes for students:
1. Collaborate with your partner(s). Everyone in the group has to contribute to the creations and execution of this activity.
2. Clarity and accuracy: your activity needs to be appropriate for the demographic you are presenting to, and needs have full and accurate information.
3. Collaboration with other groups is not required but recommended for flow in sections.

Supply chain stage prompts

Production: The practice by which food is grown/raise. This production can take place on a **rural** farm setting where the food raise comes from Concentrated Animal Feed Lot (CAFO), industrial organic farm, pasture raised, or and **urban** agriculture space where you find urban farm, roof top garden, community gardens, etc.

Processing: The practices used by food industries to transform raw plant and animal materials, such as grains, produce, meat and dairy, into products for consumers.

Distribution: This is practice of the food being send out to the market. Distribution can be by any mode of transportation (planes, trains, automobiles), and is dispensed by the company or organization that is hoping to get their food to the hands of the consumer.

Retail: This is the market in which consumers can acquire food. This can be done through purchasing the food at a grocery store or gathering food through food banks.

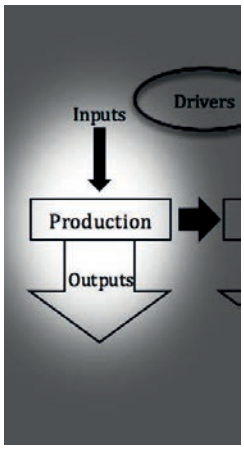
Consumption: This is the practice of preparing and eating the food that has gone through the supply chain.

Disposal: This is the practice of removing your food waste. There are many methods of waste disposal, from the landfill to what happens to the

Background reading:
http://www.foodsystemprimer.org/the-food-system/

How does it grow?

Background:
Growing plants, especially those that feed us, takes a lot of time, energy and resources. The process of raising food is exhaustive and intense. Farmers, ranchers, fishermen, etc. all work diligently to produce all the food needed to support our growing population. Without the diligent efforts of the production stage of the supply chain the rest of our society would be required to raise all of their food for themselves, a practice called subsistence farming. While subsistence farming is still practiced in many locations around the globe most developed nations have a developed agricultural sector that allows the rest of their populous to diversify their careers as well as afford many of us leisure time to pursue other things.



Purpose:
In this activity students will gain perspective on the challenges associated with growing produce in today's climate. They will be responsible for their plants, and document the plant's progress.

Objective:
Students will:

- Identify plants that are typically grown for the purpose of agriculture and the specific requirements for that plant (amount of sunlight, water, etc)
- Grow a plant from seed and gain an understanding of the amount of work needed to keep that plant alive.

Framing:
It takes a lot of time and energy to grow food from seed. The person growing all of your food need some very specific resources such as space, soil, water, sunlight and time to be successful**.** For this activity all the students will each have their own plant that they care for and record its progress until the plant matures and produces food.

Facilitator's note: You may want to decide if each student will grow the same plant, or each student has a different plant. Due to the fact that there is a percentage of all seeds that do not germinate, it is suggested that you have every student should plant at least 2 seeds.

Materials:
Planting containers: pots, milk cartons, yogurt containers etc.
Soil
Seeds
Notebooks/computer (to document progress)

Procedures:

- Have your students research the types of plants your class may be able to grow for this activity. Consider the following:
    - Where will you be growing this plant? Certain things need more space than others.
    - If growing inside how will you ensure your plants get enough water and sunlight? A sunny windowsill may work. UV lights on a timer can be great additions to the project that will help your plants grow when natural sunlight isn't available.
- Decide which plant(s) the class would like to grow and then research the following:
    - What is the yield of particular plant
    - What is the plants country of origin?
    - When and how did we start growing it in the United States?
    - Do we grow this plant on a production scale in Georgia? If so where?
    - Are there any challenges that growers face: pest, production, etc.?
    - What challenges does this plant face in regards to climate change?

Guidelines for documenting:

After planting students should care for their plant. Additionally they should document the following.

- Plants development
- Time of each watering
- Height of plant
- Size of leaves
- Color of plants and leaves.

Facilitators note: If you have access to a camera or other digital device that can take photos students can include pictures of their plant(s) as it develops.

Extension:

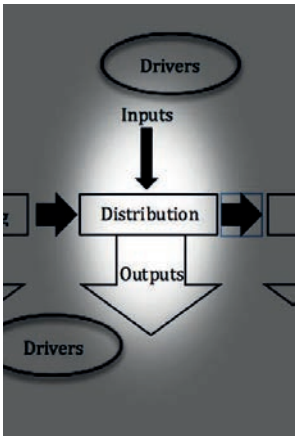
This activity provides the opportunity for a number of follow-up projects including:

- Students can explore recipes that utilize the produce they have grown.
- Utilizing their collected research and data students could create a (booklet, website, art project, etc) describing how to grow their chosen plant from seed to plate. This can provide students the opportunity to become teachers themselves and may also serve as a method of assessing their understanding of this activity.

Background reading:
http://www.foodsystemprimer.org/food-production/

Mapping our Food

Background:
From a distant field to your own plate, food can travel many thousands of miles. The transporting of our food has many different benefits including the opportunity to consume food that is otherwise out of season in your area, the chance to experience different foods that are culturally significant to people in other countries, and to more effectively feed densely concentrated population centers.



However along with these advantages there also exist a number of disadvantages to lots of "food miles". Many researchers and advocates encourage a more local or regional approach to the food system which entail cutting down the distance food may need to travel to arrive at your plate but may also come with a different set of issues.

Purpose:
This activity is meant challenges the students to think even deep in regards to the food system. With our current food model, it isn't as simple of having food grown on the farm goes directly to your plate. Instead it explores what it takes to make our food's journey work.

Objective:
Students will:

- Calculate the miles that their food travels.
- Reflect upon the potential impacts from transporting food over long distances.
- Explore alternatives to transporting food over long distances.

Essential Questions:

- Why do we transport foods over long distances?
- What are the impacts associated with transporting food over long distances?
- What are the costs and benefits associated with a small scale local food distribution vs. a large scale (national/global) food distribution?
- In what ways can local Georgia agriculture support a more local food system?

Materials:

- One food item
- Large sheet of butcher paper
- Markers
- Access to computer mapping program (ex. Google maps)

Facilitator's Note: Choose the item you would like your students to research carefully. A suggestion would be something such as a coffee cake or cookies that have several ingredients that the students will have to explore.

Procedures :

- Have your students draw a map of the United States on a large piece of butcher paper.
- Have your students locate the area on the map where your school is located.
- Students should examine the ingredients list on the packaging of the food item you are researching and record each ingredient. Are there any ingredients that students cannot recognize?
- Assign ingredients for your students to research. This can be done in small groups, pairs, or as individuals.
- Students will record and report information gathered on each ingredient.
- Students should find the States where this product is a major **commodity crop,** and record those locations on the map.
    - Students should research the product's State of origin. Where is the ingredient produced? Narrow it down to only one State if possible. If you can locate specific county or town within that State where the majority of production occurs then that would be even better.
    - Record, in both quantity (most likely measured in tons) and $'s how much of this product is produced annually in it State of origin.

Commodity crops are those that are typically grown on a large scale and publically traded. They oftentimes also make up a number of the main ingredients found in our foods.

Facilitator's note: For the following steps you will need to provide students with the grocery store or a processing plant from which this product may have been distributed. Have them look for the major locations where this aggregation may have taken place. Examples: Publix grocery store's distribution center is in Lakeland, Florida

- Students should locate and mark the store's distribution/processing center on the map.
- Students will calculate the distance from food item's production location(s) to its distribution/processing center.
- Have your students mark the location on the map for each product, and draw a line that connects production to distribution/processing, while recording mileage from point to point.
- Students will calculate the distances between distribution/processing center and grocery store visited for purchase. If possible make the general location of store. Draw a line that connects distribution/processing to retail and record mileage.

- Student will calculate the distance between the grocery store and your school. Mark location and distance between retail and record mile.
- Students should add all the mileage together for all the products. This will be the food miles for that one particular product.

Debriefing questions:

- What was the most common mode of transport for the food that you researched?
- Are any of the ingredients found in this food product also available in Georgia?
- Do you feel as if the pros of shipping food long distances outweigh the cons? Why or why not?

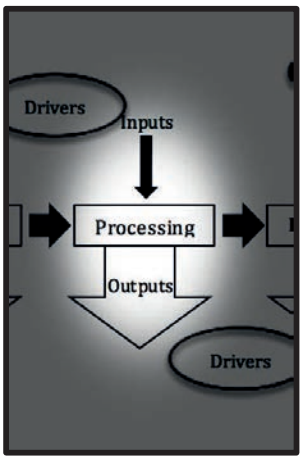
Extensions:

Since your students have calculated the mileage for this product you can take this activity one step further and have the students explore the fossil fuel cost for this one particular product. There are a number of carbon foot print calculators online you may choose to use. For example:
http://www.foodemissions.com/foodemissions/Calculator.aspx

Background reading:
http://www.foodsystemprimer.org/food-distribution/

Processed Food: The Whole Story

Background:
When we walk down the aisle of our grocery store we are meet with row after row of processed foods. By taking the raw ingredients found on the farm and milling, refining, pasteurizing, pickling, fortifying, etc. those ingredients we transform them into the foods that tend to dominate our shopping baskets. There are many different reasons we process these foods including lengthening shelf life, adding certain vitamins and minerals, enhancing flavor, or providing convenience. Many times though processing our food means affecting it in ways that can be impactful upon our own health, taking otherwise healthy ingredients and adding excessing sugars and fats. There is also the potential for detrimental environmental effects from things such as the processing of animal protein to feed a society with a growing appetite for meat. While this sort of bad rap is commonplace when discussing highly processed foods it is also easy to forget the benefits associated with turning a raw vegetable into something more easily palatable or a raw grain into a myriad of other products. By understanding the difference between these unprocessed foods, minimally processed foods, and highly processed foods we are able to make a more informed decision whenever weighing the pros and cons of each.



Purpose:
This activity provides a number of different ways to explore the difference among foods that have undergone a variable amount of processing. To better understand why we process foods we suggest the background reading found at the end of this lesson.

Objective:
Students will:

- Brainstorm reasons food processing is a necessary procedure.
- Identify the difference between different amounts of processing that occurs with foods.
- Explore different food processors in the state of Georgia and the level of transparency they provide consumers throughout the processing stages.

Essential Questions:

- Why and how do we process foods?
- Which food processors operate in the state of Georgia and how does their company mission/philosophy effect the way they conduct their business?

Materials:
While it is ideal to provide students with the actual food products discussed in these activities it may not always be feasible to do so. While discussing the food items highlighted in Part 1 you may choose to use the **Food processing activity cards** provided in the appendix .

Procedures:
Part 1

- Brainstorm with the class how and why we process foods. A raw food is considered something that has not been altered from its original state whether that is a freshly picked strawberry or a freshly slaughtered chicken. Brainstorm some of the reasons we may choose to alter these raw foods into the foods we consume.
- Students will arrange the foods provided into order from most processed to least processed. This should be done without revealing the information on the back of the card.
- Discuss with the students the advantages to processing each of these foods. You can use the information on the back of the **Food processing activity cards** to help you out.
- Students should identify, if time allows, where in Georgia the processing facility for each food is located.

Reasons we may choose to process our food includes:

- Safety- cooked and pasteurized is safer than raw over the long term.
- Convenience
  - The chance to enjoy foods even when they are out of season
  - Longer shelf life
  - Easier preparation
- We can fortify and enrich certain foods with vitamins and minerals to increase there nutritional value
- Enhanced taste of otherwise bland foods.

Debriefing questions:

- Why did the students arrange the foods the way that they did?
- How does the perception of healthfulness of a product relate to the amount of processing it undergoes?
- How does processing make these foods safer for the consumer?

Part 2- Transparent tuna
For this part of the activity students will explore how a company can provide consumers with transparency about how their product is processed by exploring two more Georgia food processing companies, Trident tuna and Chicken of the Sea.
You may want to bring in a can of each of these locally processed products. In order to complete part 2 of this activity you will need the "can code" (note: this is different than the barcode) found on all Chicken of the Sea products.

- Students will use each companies website students to research the sustainability mission and philosophy of each company.
  - Chicken of the Sea- processed in Lyons, GA http://chickenofthesea.com/company

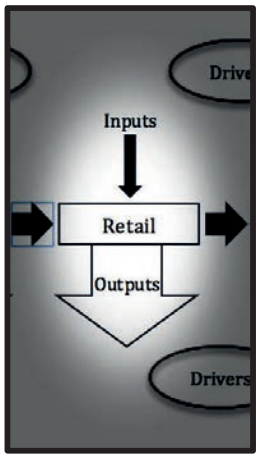
    - Trident foods- processed in Carrolton, GA http://tridentseafoods.com/Our-Story
- Brainstorm with the class why it is important for a company to be transparent with the ways in which they process our foods.
- Students can use a "can code" found on a Chicken of the Sea to identify where that particular tuna came from utilizing the tracing tool found on their website, http://chickenofthesea.com/trace
- Students should record all relevant information about where the product came from and share with the class. Sections 5 and 6 of the tracing webpage discuss processing specifically.
- Discuss with the class the different ways in which your product was processed.

Extension:
As an alternative activity you can have students contrast and compare the ingredients in salsa vs. cheese dip from Mission foods (also processed in Georgia) to see how many different ingredients they recognize. What are the ingredients that are hard to identify in each product and what are they used for?
http://www.missionmenus.com/products/category/salsa-dips

Background Reading:
http://www.foodsystemprimer.org/food-processing/

Packaging Detectives

Background:
With all the products in the grocery store and all the advertising that goes into those products it can sometimes be overwhelming as you navigate the aisle to pick out the best product for you. Bright colors draw us in, and we connect to words like "natural", "organic" "healthy" that feel like promises of the way our food should be. Then, when we get home we may find ourselves too busy to stop and really explore whether all that campaigning for our dollars is true. In this activity students will utilize critical thinking skills, as they work together to break through the packaging codes.



Facilitator's note: There are two different ways in which this activity may be facilitated.

- *Option 1, students will bring in a food item from home. These items will connect students to the food choices that take place in their family.*
- *Option 2, the teacher will provide the students with packaged products produced in Georgia. Georgia has a variety of familiar products, and using these products connected them to food companies in our own backyard. See list of Georgia food producers below.*

Purpose:
Students will explore how the font, colors, and other visuals are used to make food packaging more appealing to consumers. Students will analyze packaging of various food items to decide things such as:

- Does the messaging on the front of food packaging match the back of the packaging where the nutritional information is located?
- Does the language, words like crunchy, smooth, crisp, on the outside of the packaging equal the inside contents?

Objective:
Students will:

- Examine store packaging and try to determine what the product is really trying to tell the consumer.
- Identify the ways in which specific elements of a food items packaging can affect a consumer's purchase of that products.

Essential Questions:

- When you purchase food, what visual cues matter the most?
- How accurate is the visual information and language on food packaging?

Materials:
Pen
Paper (*Optional*: Packaging Detectives worksheet –in appendix)
Packaged food item from home or provided by teacher

Procedure:

- Hand out packaging from various products to each student or to each group of students.
- Students should record impressions of the packaging and the message it is trying to convey. You may choose to use the **Packaging Detectives worksheet** found in the appendix
- Have students switch products with a partner and explore your partner's food product.
- Reconvene students and allow them to compare their info.

Debriefing questions:

- What ideas does this packaging convey?
- How does the packaging deliver these ideas to the consumer? (use of logos, specific colors, characters on the packaging, etc)
- Does the message that the front of the packaging attempt to convey match the back of the packaging where the nutritional content is located?
- Does the language, (i.e. words like crunchy, smooth, crisp) on the outside of the packaging equate to what is found on the inside?
- Do you feel this product equals the story that the packaging tells the consumer? If so how? If not why? And what should the packaging say instead.

Georgia based companies to explore:

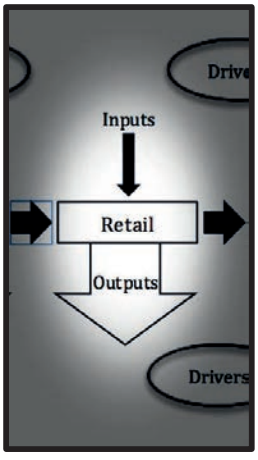
Chicken of the Sea
The Coca-Cola Company
Flowers Foods
Frito-Lay
General Mills
Hostess
Kellogg's USA
Kikkoman
King's Hawaiian
Koch Foods
Lehui Enterprises
Mars
National Beef
Organic Milling
Perdue Farms
Pilgrim's
Pillsbury
Tyson Foods
Unilever
Wrigley

Background Reading:
http://www.foodsystemprimer.org/food-processing/

Marketing and Labeling Memory

Background

As we stroll through the aisles of our local supermarket we are bombarded by displays and labels meant to entice our interest and whet our appetite. The amount of information available to us on our food labels can sometimes be overwhelming. What does a label actually tell us about the quality and healthfulness of a product when compared to another sitting beside it? Oftentimes labels on food packaging can be an honest attempt to educate the consumer about the ideals of a company and sometimes labels are used to sell a product without any clear meaning behind them.



A better understanding of labels can help the consumer cut through all the static that accompanies a grocery shopping trip and allows each of us to decide which products truly speak to us in terms of their sustainability and which labels are provided as little more than a marketing tool.

Purpose:

Through playing a simple game students will become more familiar with specific labels that they may find on their food. There will be two rounds of this game, that allow students to first learn the labels visually, and then help student examine what each label is telling them.

Objective:

Students will:

- Identify different food labels and what message they provide consumers about a food product.

- Explore the origin of each label including the organization that provides the label and what process the food manufacturer must go through in order to obtain that label for their product.

Essential questions:

- Why do we need to market and label our food?
- In what ways can marketing be different from labeling? In what ways are they the same?
- How does the Georgia Grown label support Georgia's agricultural community?

Materials:

2 copies of **Marketing and labeling activity cards**- Found in appendix

Framing:

Most food products contain some sort of label and/or logo identifying certain information about that product. What are those labels and logos really telling us though? Perceived healthfulness, better taste, or safe for the environment, a label can be a powerful tool that lets us know what that food is all about. In this activity you will be using observation skills to play a matching game with various food labels. By familiarizing yourself with these labels you can more easily recognize them when you may see them in the grocery store. You will also learn the message behind each label so that you can better understand what the label really means.

Procedure:

Round 1: Learning the labels

- Students should lay cards out in a grid face down,
- One person will flip one pair of cards over at a time as in a game of memory.
- Each player can earn a set of cards by making a match.
- Students will play until all cards are collected. The player with the most sets of cards at the end of the round wins.

Round 2: Learning the labels meaning

- Students should lay cards out in a grid face down. Instead of matching labels, this round uses definitions that must be matched to the corresponding label from round #1. Each definition explains what that label really means.
- One person will flip one pair of cards over at a time as in a game of memory.
- Each student tries to match the image of the label card with the description of what the label means.
- Each player can earn a set of cards by making a match.
- Students will play until all cards are collected. The player with the most sets of cards at the end of the round wins.

Facilitator's note: Depending on the level of challenge needed the facilitator may need to go over definitions ahead of time.

Georgia created its own label, Georgia Grown, which is included in this game. The Georgia Grown label is meant to serve as a economic stimulus for Georgia raised food. Students can research more about this state specific label.
Georgia Grown website- www.georgiagrown.com

Extension:
Much thought went into the designing of the logos for these certifications. They are meant to convey an idea about what that food product stands for.

What other regulations and certification standards would you most like to see for the state of Georgia?
How would you design the logo to visually express that standard?

Background reading:
http://www.foodsystemprimer.org/food-and-nutrition/food-marketing-and-labeling/

Labels and Definitions key

Non-GMO Project Verified
What it means: The Non-GMO Project's seal verifies that products have been "produced according to rigorous best practices for GMO avoidance," including testing of all GMO risk ingredients. While final products don't have to be tested and the label doesn't guarantee a product is 100% GMO-free, you can be sure that products bearing the seal have met the highest standards possible for non-GMO, including testing, traceability, and segregation.
See it on: Dairy products, produce, coffee, tea, chocolate, meat, poultry, eggs and processed products.

American Humane Certified
What it means: Run by Human Farm Animal Care, this program offers three levels of certification. All levels of certification prohibit certain common production practices such as forced molting of birds through starvation but do allow for certain other practices such as beak cutting.
See it on: Eggs

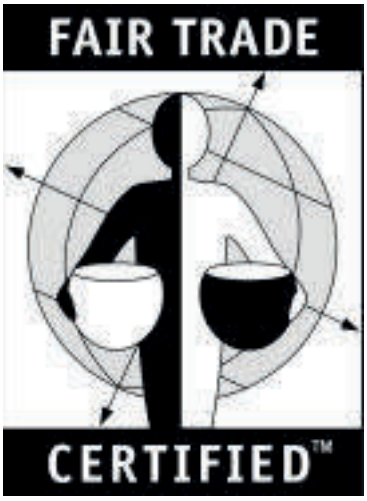
American Grassfed
What it means: This 3rd party verified logo ensures livestock feed on grass only and never grain for their lifetime and always have access to pasture. Additionally, growth hormones and antibiotic use is prohibited.
See it on: Dairy products, poultry, eggs, and meat.

Georgia Grown
What it means: Agriculture program that focuses on the economic development of GA agriculture. Overseen by the Georgia Department of Agriculture. The goal is to aid the agriculture economy of the state by bringing together producers, processors, suppliers, distributors, retailers, agritourists, and consumers in one powerful statewide community.
See it on: Vegetables grown in Georgia

Certified Vegan
What it means: Signifies that products are vegan, defined as containing no animal ingredients or by-products in the manufacturing process, and not tested on animals by any company or independent contractor.
See it on: Product that do not contain meat of any animal by-product

Certified Naturally Grown
What its means: Grassroots alternative to the USDA's National Organic Program meant primarily for direct-market farmers and beekeepers distributing through local channels such as farmer's markets, roadside stands, local restaurants, Community Supported Agriculture (CSA) programs and small local grocery stores.
See it on: Many different products

Rain Forest Alliance
What it means: A product is guaranteed by a third party to meet high standards for wildlife conservation, worker welfare and benefits to local communities. While farmers can use pesticides, the amount and type is strictly controlled and must continually be reduced.
See it on: Coffee, tea and chocolate



Fair Trade Certified
What it means: Farmers enjoy safe working conditions, living wages, fair prices for crops and they invest in business and community building projects. Plus, pesticides and GMOs are strictly prohibited.
See it on: Coffee, tea, chocolate, fruit, wine, sugar, rice and vanilla

Marine Stewardship Council
What it means: Fish comes from a sustainable fishery that's well-managed and doesn't cause environmental degradation or overfishing. This third-party certified verification also adds credibility to the words "wild-caught" on seafood packaging.
See it on: Fish

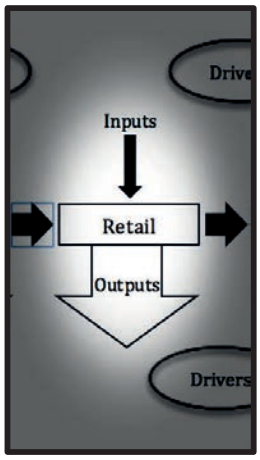
Food Alliance Certified
What it means: A third-party verified seal. Products bearing this logo contain no genetically modified crops or livestock; no artificial flavors, colors or preservatives; and ensure healthy and humane care for livestock with no growth promotants or sub-therapeutic antibiotics. Plus, any product with this logo must maintain verified supply chain traceability.
See it on: Dairy products, produce, poultry, eggs and meat

USDA Certified
What it means: Certified by the US Department of Agriculture's National Organic Program. In order to receive this seal products must be at least 95 percent organic meaning all ingredients contain no pesticides, fertilizers, hormones, antibiotics, radiation and no genetic engineering was used.
See it on: Produce, coffee, tea, chocolate, meat, poultry, eggs and processed products

Animal Welfare Approved
What it means: Farmers, veterinarians, researchers and scientists collaborated to develop welfare standards now called the "most stringent" by the World Society for the Protection of Animals. This third-party verified label promises that animals are raised humanely outside on true family farms on pasture or range.
See it on: Dairy products, poultry, eggs and meat

Grocery Store Lab

Background:
How many of our students go shopping for more than a candy bar at the grocery store? Are they aware of the layout and could they navigate it to find what they need? Do the students have any idea what it is like to buy food for multiple meals and multiple people? Many of us have to plan carefully when we head to the grocery store as we give careful consideration to our household budget. In this activity students have the opportunity to explore what it takes to shop for their food. Students will also have the chance to role play what it is like to shop for food when money is tight and they have to plan for how to get the most nutrition from their food.



Purpose:
In this lab students will be using real Atlanta family scenarios. These scenarios are available from the **Atlanta Community Food Bank (ACFB) Hunger 101** curriculum's, *Family Budget* activity. Students will also use the Supplemental Nutritional Assistant Program (SNAP) eligibility form to calculate whether the family scenario provided qualifies for government assistance. If time allows, this activity also includes a field trip to a local grocery store. This lab can be completed in 1-2 class period, depending on the length of your class periods, and proximity of your school to your closest grocery store.

Objective:
Students will:

- Role-play the process of establishing a family budget and calculating what percentage of that budget can be allotted to purchase food.
- Examine the federal food assistance program available to low-income families.
- Design a weeklong food menu and necessary grocery list and then visit a local store to attempt to "shop" for the items on their list.

Essential Questions:

- How does the layout of a grocery store affect your shopping experience?
- In what ways can it be challenging for a family to shop for food?

Materials:
Paper
Pencil/Pen
Clipboards
Family Budget Scenario These scenarios are downloadable from the ACFB's Hunger 101 curriculum-Activity #6 http://acfb.org/educational-materials#hunger-101-curriculum
Menu/Shopping Guide for each student- found in appendix

Procedures:

- Pair students together for this activity.
- Distribute a *Family Budget* scenario from the ACFB curriculum to each group. You may choose to assign family scenarios or let your students choose at random.
- Have students read through the monthly income and the utilities carefully and note amount of money allocated to each.
- Students will calculate the money that is left over to purchase food for their family.
- Students need to calculate how much of the money left over is needed to buy a week worth of groceries for their family scenario.
- Using the chart found at the end of this activity, students should calculate whether the family in their scenario would qualify for the SNAP benefits (If their family does qualify for SNAP than have them calculate and factor in the additional funds that the family will have for food.*
- Students will design a menu that includes meals for one week for their family and organize a shopping list**. Shopping list can be recorded on Menu/Shopping worksheet found in the appendix.
- Encourage students to consider that this menu should feed all members of their family and should be healthy, balances, and diverse. This list should include a healthy and balanced mix of foods that encompass the USDA's Choose My Plate standards.

Facilitators note: A trip to a local grocery store to actually shop for the items on the students menu can provide a great culminating experience for your students. It is strongly encouraged that you consider doing so if you have the time and available resources. It is typically a good idea, before the fieldtrip, to call up the grocery store and get permission from the store manger to be there with your students.

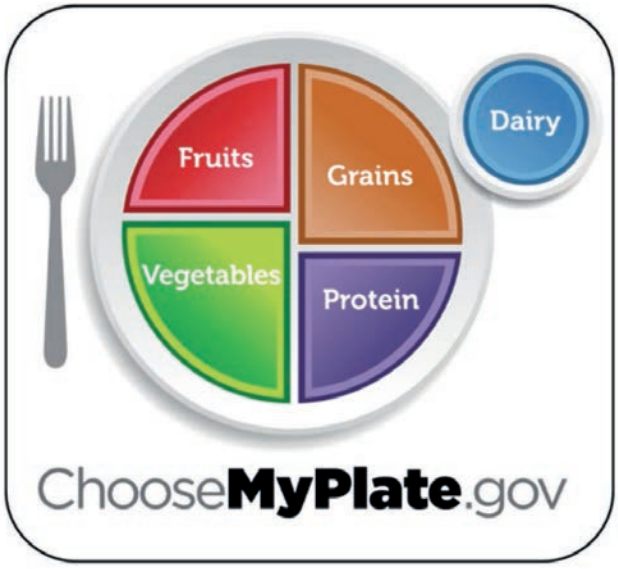
Provide students time to "shop" for their family. They do not need to actually collect the food items. Instead they should use their Menu/Shopping Form to clearly record "purchased" items. They should record serving amounts per package, and price of each "purchase". Once back at school, give students time to share their menu with the rest of the class.

**Some families will qualify for SNAP and some will not. The difference of a dollar can make all the difference.*
***The amount of meals will depend on the amount of people, and the time of year. If they are going shopping during the school year, then some schools provide lunch, and breakfast. If the family quality for SNAP benefits, then student most likely qualify for reduced school lunches.*

Debrief questions:

- Are you able to ensure each of the meals you have planned is incorporating the food groups discussed in the Choose My Plate standards? And the serving amounts?
- Is your menu diverse and does it include things you would like to eat for a week? There should be a 3 meals available a day along with snacks. (link to MyPlate standards can be found below)

- What other options are available to families who find it difficult to put food on their table.



https://www.choosemyplate.gov

In order to qualify, you must have an annual household income (before taxes) that is below the following amounts:

Household Size*	Maximum Income Level (Per Year)
1	$15,444
2	$20,826
3	$26,208
4	$31,590
5	$36,972
6	$42,354
7	$47,749
8	$53,157

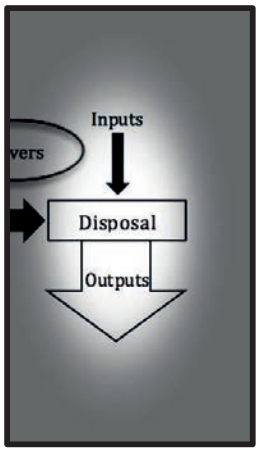
See https://www.benefits.gov/benefits/benefit-details/1582 for further information.

Background reading:
http://www.foodsystemprimer.org/food-and-nutrition/food-environments/

Curbing Food Waste: An Action plan

This activity was adapted from Johns Hopkins Center for a Livable Future's Food Citizen Action Project

Background:



Food waste and disposal is the oftentimes forgotten step in our food system. Once we "throw something away" it is out of sight and out of mind. In truth though what does it mean for something to go away? It may leave our home and our cognizance but it may take a very long time for it to ever be gone. Food is part of the nutrient cycle of our planet. It requires nutrients from the soil to be created and, once produced, can be returned to the soil again through the process of decomposition. However this is oftentimes not the fate of our food. Instead we toss it into plastic trash bags, which hamper decomposition, and then toss those bags into a landfill. In fact the city of Atlanta's landfills contain more food waste (over 12% of the total volume) than any other one type of trash that it rests alongside in the landfill.

Though we as consumers throw out a lot of food, waste in the food system may come at any step along the way. Food is tossed out on the farm during production for a variety of different reasons including bruising or other damage to fruits and vegetables. Food loss occurs during processing due to disinterest in parts of the food such as skin, fat from animal proteins, or peels. Grocery retailers want to keep shelves stocked with the best looking produce and this oftentimes means tossing out the stuff that doesn't sell quickly enough. No matter the cause, waste is inherent in our food system though with some careful consideration we, as consumers, can work towards mitigating the waste of food.

Purpose:

Students will use their own independent research to dig deeper into the issue of food waste. They may choose to look at their own waste stream or the waste stream from some other part of the supply chain. The topic of what we throw away is one that can be easily measurable as it is the step that comes right after our own consumer stage of the supply chain. However students may find that by exploring waste from elsewhere in the supply chain they are able to gain a better understanding of one of the many hidden costs of our food system.

Objective:

<u>Students will</u>

- Research different ways in which waste is generated along the entire supply chain.
- Develop strategies for how we can stem the amount of food waste coming from different stages of the supply chain either through direct action or by educating others.
- Implement their strategies by designing an action plan for their own home/school/ community/etc.

Essential Questions:

- How is food waste generated along the supply chain?
- How can we reduce food waste?

Framing:

Over 40% of the food that we produce on our planet is thrown out instead of consumed. It is estimated that food loss costs a family of four at least $589.76 annually. We aren't the only culprits though as others parts of the food system such as farms and grocery stores generate a lot of waste too. All that waste has to go somewhere and typically it is headed for a landfill. With our current rate of waste generation in Georgia it has been projected that our current municipal landfills will reach their capacity in the next 20 or so years. So what role can each of us play in curbing food waste production, not only in our own homes, but elsewhere in the food system as well? In this activity you get the chance to research and design your own action plan to help reduce food waste.

Procedure:

- Brainstorm with the class to identify a spot within the food system where food waste is a problem. This could be in the home, at school, at the grocery store, during transportation, on the farm, etc. Students should research why we waste food at that point in the food system. Is it because we have a misunderstanding of what expiration dates mean on our food? Is it because your local grocery store tosses out blemished produce? Is it because a drop in market value means a Georgia farmer can't afford to transport their food to market so instead they let it rot in the field? These are all possibilities that your students may want to explore.
- Have students research the downstream effect of waste that is being produced. How much of that food ends up in a landfill? Who else could have used that food if it hadn't been wasted?
- Students will decide upon an intervention intended to address this issue. How would you like to work to solve this problem?
- Students will identify resources to help you with your plan to solve the problem. An example, some food that would otherwise be wasted is instead welcomed by organizations in Atlanta that work to feed the hungry. Learn more by utilizing the links in the extensions portion of this activity.
- Have students define the hurdles you expect to encounter as you work towards your action plan.

This activity was adapted from Johns Hopkins Center for a Livable Future's Food Citizen Action Project

Background reading:
http://www.foodsystemprimer.org/wasted-food/

Appendix

Marketing and labeling activity cards (*Marketing and Labeling Memory)*

GEORGIA grown	**What it means:** Agriculture program that focuses on the economic development of GA agriculture. Overseen by the Georgia Department of Agriculture. The goal is to aid the agriculture economy of the state by bringing together producers, processors, suppliers, distributors, retailers, agritourists, and consumers in one powerful statewide community. **See it on:** Vegetables grown in Georgia
CERTIFIED VEGAN vegan.org	**What it means:** Signifies that products are vegan, defined as containing no animal ingredients or by-products in the manufacturing process, and not tested on animals by any company or independent contractor. **See it on:** Product that do not contain meat of any animal by-product
CERTIFIED NATURALLY GROWN	**What its means**: Grassroots alternative to the USDA's National Organic Program meant primarily for direct-market farmers and beekeepers distributing through local channels such as farmer's markets, roadside stands, local restaurants, Community Supported Agriculture (CSA) programs and small local grocery stores. **See it on:** Many different products

	**What it means:** The Non-GMO Project's seal verifies that products have been "produced according to rigorous best practices for GMO avoidance," including testing of all GMO risk ingredients. While final products don't have to be tested and the label doesn't guarantee a product is 100% GMO-free, you can be sure that products bearing the seal have met the highest standards possible for non-GMO, including testing, traceability, and segregation. **See it on:** Dairy products, produce, coffee, tea, chocolate, meat, poultry, eggs and processed products.
	**What it means:** This 3rd party verified logo ensures livestock feed on grass only and never grain for their lifetime and always have access to pasture. Additionally, growth hormones and antibiotic use is prohibited. **See it on:** Dairy products, poultry, eggs, and meat.
	**What it means:** Run by Human Farm Animal Care, this program offers three levels of certification. All levels of certification prohibit certain common production practices such as forced molting of birds through starvation but do allow for certain other practices such as beak cutting. **See it on:** Eggs

	**What it means**: A product is guaranteed by a third party to meet high standards for wildlife conservation, worker welfare and benefits to local communities. While farmers can use pesticides, the amount and type is strictly controlled and must continually be reduced. **See it on**: Coffee, tea and chocolate
	**What it means:** Farmers enjoy safe working conditions, living wages, fair prices for crops and they invest in business and community building projects. Plus, pesticides and GMOs are strictly prohibited. **See it on:** Coffee, tea, chocolate, fruit, wine, sugar, rice and vanilla
	**What it means:** Fish comes from a sustainable fishery that's well-managed and doesn't cause environmental degradation or overfishing. This third-party certified verification also adds credibility to the words "wild-caught" on seafood packaging. **See it on:** Fish

	**What it means:** A third-party verified seal. Products bearing this logo contain no genetically modified crops or livestock; no artificial flavors, colors or preservatives; and ensure healthy and humane care for livestock with no growth promotants or sub-therapeutic antibiotics. Plus, any product with this logo must maintain verified supply chain traceability. **See it on:** Dairy products, produce, poultry, eggs and meat
	**What it means**: Certified by the US Department of Agriculture's National Organic Program. In order to receive this seal products must be at least 95 percent organic meaning all ingredients contain no pesticides, fertilizers, hormones, antibiotics, radiation and no genetic engineering was used. **See it on:** Produce, coffee, tea, chocolate, meat, poultry, eggs and processed products
	**What it means:** Farmers, veterinarians, researchers and scientists collaborated to develop welfare standards now called the "most stringent" by the World Society for the Protection of Animals. This third-party verified label promises that animals are raised humanely outside on true family farms on pasture or range. **See it on:** Dairy products, poultry, eggs and meat

Food processing activity cards (*Processing our food*)

Georgia Peaches

Though oftentimes turned into canned fruit, jams, jellies, etc. the Georgia Peach is at is most basic form a completely **unprocessed food.** Commonly grown throughout central Georgia, these are then harvested, cleaned, boxed up, and shipped to your local grocer.

AtlantaFresh Milk

Begun in 2009, AtlantaFresh creamery provides consumers with milk and other dairy products from locally sourced grass-fed cows. Commercially produced milk is **minimally processed** via pasteurization.

Cheerios

The General Mills company operates a large processing facility in Covington, GA. These tasty O's have been a staple at the breakfast table for many years. The wealth of ingredients ensures a certain level of quality and a long shelf life. However this also means a **highly processed food** as well.

Nature's Own bread

Nature's Own is considered on of the best selling brands of bread produced by Thomasville, GA headquartered Flower Foods. However shipping this product all over the country means **high levels of processing** to ensure shelf life. Nature's Own is not along though. Most commercially produced bread requires extensive processing.

Perdue chicken nuggets

With GA being the top chicken producing state in the country its no wonder the Perdue company's processing facility in Perry, GA generates lots of chicken products. These nuggets contain a wealth of added ingredients to ensure flavor freshness and examples of **highly processed** foods.

Lays Classic potato chips

First produced in Atlanta in the 1930's, Lays (now Frito-Lay) still has a processing facility in Kathleen, GA. Classic Lays requires **minimal processing** when compared to other snacks. The oils used to produce these chips cause them to be high in fat content and are therefore considered by many to be unhealthy even though the chips only consists of a handful of ingredients.

Packaging Detective worksheet (*Packaging Detectives)*

Food product_____
Company_____

Upon initial inspection of this product, what is your first impressions of the product based on it's packaging?

_____
_____
_____
_____

What color is the packaging? What role does color play in the marketing of the product?

_____
_____
_____
_____

Briefly describe the font used on the packaging? What is the purpose of using this particular font with this product?

_____
_____
_____
_____

Describe any text provided on the packaging. What is the purpose of using this particular font with this product?

_____
_____
_____
_____

Does the packaging include a mascot, a spokesperson, or other image? ? If so, what are they trying to convey?

_____
_____
_____
_____

Does the packaging include any statistics? If so, what are those statistics trying to convey?

_____
_____
_____
_____

After deeper inspection of this product, have your impressions of this product changed? Explain.

_____
_____
_____

Supply chain activity cards (*Supply Chain Activity)*

Production	Transportation
You are a hard working farmer whose job lies at one end of the supply chain. <u>To help your group understand what you do read the following.</u> *Hi, I am a farmer. You, the consumer, and I may never meet however the work I do each day provides a wealth of food resources. It isn't always easy work but at least its simplified compared to the way folks farmed a century ago. Now I run a poultry farm and I want to ensure that I get the best chicken possible from my chicken houses here in North Georgia to you. I may look young but the average age of a chicken producer is actually around 53 years old. Not a young person's job.*	You are part of the larger system within the food system, which is transportation. Before being processed raw goods must be moved from the farm. You are one part of how stuff gets to the processing facility. <u>To help your group understand what you do read the following.</u> *Hi I am a truck driver. My specific task is to transport the live chickens to the processing plant. If there happens to be a plant just down the road then my job is much easier however sometimes I might transport these chickens upwards of 1500 miles just to get slaughtered.*
Processing	**Distribution**
You are the processing leg of the food supply chain. You work in a processing facility along with other butchers to remove the feathers, head, feet, organs, and perhaps bones from the chickens as well as any additional processing to turn the chickens into things such as tasty chicken nuggets and patties. <u>To help your group understand what you do read the following.</u> *Hi I am a meat processor. I work in what is referred to as the disassembly line. Here we turn a chicken from a bird into the various products our company sells. I spend my day on the disassembly line making the same cuts over and over again. In addition to being processed here the meat is also inspected by the US Department of Agriculture (USDA) to ensure that everything is safe and healthy for you the consumer.*	You are part of the larger system within the food system, which is distribution. After being processed all goods we consume are distributed far and wide. You are one part of how stuff gets where it's going. <u>To help your group understand what you do read the following.</u> *Hello. I am yet another truck driver. Now that our chicken has been transformed into tasty chicken patties, inspected, and packaged it is my job to get it to your town. Much like my fellow truck driver on the other side of the processing step of our food supply chain the distance I will travel with this box of chicken patties can vary.*

Grocery Store	Consumption
You are the retailer and never forget that you are the face that is most associated with that tasty chicken you are selling. <u>To help our group understand what you do read the following.</u> *Hi. I am the store manager at your favorite grocery store. I want to make sure that you get just the right sort of chicken products for your upcoming dinner. While you are at it be sure to pick up any of the other things you need around the store as well. The meat department is in the back and produce is along the right side of the store just in case you want to get some tomatoes to top your chicken sandwich. You can pick up everything else such as buns, chips, soda, condiments, etc. from the center of the store. Thanks for shopping with us.*	You are whom this whole process is about. While this supply chain has kept hundreds or perhaps even thousands of people on the job in the end it also provides you the food that you need. <u>To help our group understand what you do read the following.</u> *Whew! I am hungry. I can't wait to cook up these chicken sandwiches for our dinner. I have a big family so I have to make sure I have enough food to feed everyone. I really like to cook to so we are going to have a bunch of awesome side dishes with all of the groceries I just picked up.*
Waste Disposal	
Here you are. End of the line and yet many of us may forget that you are part of this process as well. <u>To help our group understand what you do read the following.</u> *Hey there. I am your local sanitation worker. After you and your family are done with dinner I, and other workers like me will be happy to pick up your trash from the curb. My buddies at the recycling facility can take care of any plastic, paper, or glass that you may have. The rest of this stuff is headed to the local landfill. Now if you lived in a really densely populated place like New York City you might even ship your trash to other states like Georgia.*	

Sunday	**Item Price**	**Monday**	**Item Price**	**Tuesday**	**Item Price**	**Wednesday**	**Item Price**	**Thursday**	**Item Price**	**Friday**	**Item Price**	**Saturday**	**Item Price**
Breakfast		*Breakfast*		*Breakfast*		*Breakfast*		*Breakfast*		*Breakfast*		*Breakfast*	
Lunch		*Lunch*		*Lunch*		*Lunch*		*Lunch*		*Lunch*		*Lunch*	
Dinner		*Dinner*		*Dinner*		*Dinner*		*Dinner*		*Dinner*		*Dinner*	

Resource List

Films:

A Place at the Table

This documentary explores the national issue of food insecurity. The viewer follows several families throughout the film, witnessing their day-to-day struggle with the lack of healthy food options. **Pairs well with the Grocery Store Lab.

King Corn

Studies' have shown that we eat corn, or products derived from corn every single day in vast quantities. From the breakfast cereal and yogurt we eat in the morning, to the sandwich and soda we have for lunch, to the salad dressing and meat marinade at dinner. Lots and lots of corn is in our food, and this story follow the journey of two filmmakers interested in the history of this commodity crop, as they try to tackle the daunting task of tracking this grain from the farm field to your plate. **This film can be paired with the Supply Chain and Food Mapping activities.

Grow!

In Grow! viewers meet the next generation of local growers in Georgia. Visiting farms all over the state, this film meets a group of highly educated agrarians, who approach farming with a passion for the future of food. Embracing both traditional and innovative techniques, these farmers show strength of will, as they face challenges with changing environmental climate and traditional farming demographic. **Pair with How does it Grow Activity

Food Chains

In this documentary you meet the growers who cultivate the food for American citizens. A story of the relationship between the producers and retailers, and the challenges they face working together. ** Pair with any part of the supply chain.

Links:

Johns Hopkins Center for a Livable Future
Facilitator background readings

- General food system info- http://www.foodsystemprimer.org/the-food-system/
- Food production info- http://www.foodsystemprimer.org/food-production/
- Food distribution info- http://www.foodsystemprimer.org/food-distribution/
- Food processing info- http://www.foodsystemprimer.org/food-processing/
- Food waste info- http://www.foodsystemprimer.org/wasted-food/
- Food safety- http://www.foodsystemprimer.org/food-safety/
- Food policy- http://www.foodsystemprimer.org/food-policy/

Production stage resources

- Georgia Organics: GMO's in Georgia
  Explores the current use of GMO's in GA.
  http://georgiaorganics.org/news-center/GMOs-in-Georgia
- Georgia Farm Bureau: Georgia's $74 Billion Dollar Industry
  Facts and figures about GA agriculture
  http://www.gfb.org/aboutus/georgia_agriculture.html
- White Oak Pasture
  Sustainable chicken and beef producer in Bluffton, GA
  http://www.whiteoakpastures.com/page.asp?p_key=14B2CB7673CE48D98352F2D597C9B77E
- Economic Impacts of Climate Change in Georgia
  Research article detailing the effects of climate change on GA agriculture.
  http://cier.umd.edu/climateadaptation/Georgia%20Economic%20Impacts%20of%20Climate%20Change.pdf
- Food and Agriculture Organization of the UN: Climate Change and the Food System
  A look at the UN's take on how climate change will affect our food system.
  http://www.fao.org/3/a-i4332e/index.html
- National Geographic's: Feeding 9 Billion-
  Explores the impacts associated with the feeding of a rising global population
  http://www.nationalgeographic.com/foodfeatures/feeding-9-billion/
- Georgia Organics: Nuts About Organics at Organic Peanut Field Day
  Article detailing organic peanut farming in GA.
  https://georgiaorganics.org/2014/07/nuts-about-organics/
- Georgia Organics: What if Georgians ate Georgia produce
  A look at the economics of buying locally grown GA produce.
  http://georgiaorganics.org/news-center/news-articles/what-if-georgians-ate-georgia-produce/
- Georgia Organics: Curriculum
  Other food system curriculum offerings from GA Organics.
  http://georgiaorganics.org/for-schools/curriculum#high

Consumer stage resources

- USDA Supplemental Nutritional Assistants Program (SNAP)
  Information about the USDA program's eligibility criteria
  http://www.fns.usda.gov/snap/eligibility
- Atlanta Community Food Bank
  The ACFB's Hunger 101 curriculum.
  http://acfb.org/sites/default/files/Hunger-101-Curriculum-2016.pdf
- Voting with our Forks
  Michael Pollan's editorial empowering consumers to make a change in their food system.
  http://pollan.blogs.nytimes.com/2006/05/07/voting-with-your-fork/?_r=0
- Household Food Security in the United States
  A look into the statistics of food insecurity in our country.
  http://www.ers.usda.gov/media/884529/err-141-summary.pdf
- AJC: Atlanta's Food Deserts
  Atlanta Journal-Constitution article detailing the prevalence of food deserts and food insecurity in Atlanta.
  http://investigations.myajc.com/fooddeserts/
- Feeding America: Map the Meal Gap
  Statistics about food insecurity nationwide.
  http://www.feedingamerica.org/hunger-in-america/our-research/map-the-meal-gap/2012/2012-map-the-meal-gap-tech-brief.pdf
- Wholesome Wave Georgia
  Program that allows consumers using SNAP benefits to get double their money when buying food at farmers markets.
  http://www.wholesomewavegeorgia.org/
- USDA: Trends in local and regional Food systems
  2015 USDA report on the viability of local and regional food systems
  http://www.ers.usda.gov/media/1763057/ap068.pdf
- USDA Choose MyPlate
  Information about the Choose MyPlate nutrition program
  https://www.choosemyplate.gov
- Tristram Stewart: The Global Food Waste Scandal
  TED talk about the ubiquitous waste in our food system
  https://www.ted.com/talks/tristram_stuart_the_global_food_waste_scandal?language=en

Marketing and labeling info

- Mother Nature Network-
  Source of info for Marketing and Labeling activity. Additional labels included.
  http://www.mnn.com/food/healthy-eating/stories/17-food-certification-labels-decoded
- Ecolabel index.
  Description of most labels found on products in the United States.
  http://www.ecolabelindex.com/ecolabels/?st=country,us

- The Humane Society-
  Decoding of egg carton messages
  http://www.humanesociety.org/issues/confinement_farm/facts/guide_egg_labels.html
- FDA: Guidance for Industry
  A Food Labeling Guide
  http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/LabelingNutrition/ucm064894.htm

Labeling organization links

Non-GMO:
http://www.nongmoproject.org/gmo-facts/
USDA Organic
http://www.usda.gov/wps/portal/usda/usdahome?contentidonly=true&contentid=organic-agriculture.html
GeorgiaGrown:
https://www.georgiagrown.com
American Humane Certified:
http://www.humaneheartland.org/our-farm-programs/american-humane-certified
Certified Naturally Grown:
http://www.cngfarming.org
Rainforest Allience Certified: http://www.rainforest-alliance.org/about/marks/rainforest-alliance-certified-seal
Fair Trade Certified:
http://fairtradeusa.org/certification
American GrassFed:
http://www.americangrassfed.org
Food Alliance:
http://foodalliance.org
Certified Sustainable Seafood MSC:
https://www.msc.org
Certified Vegan:
http://vegan.org/vegan-certifications/

Research articles

Bissonnette, M. M., & Contento, I. R. (2001). Adolescents' perspectives and food choice behaviors in terms of the environmental impacts of food production practices: Application of a psychosocial model. *Journal of Nutrition Education*, *33*(2), 72-82.

Monroe, J. T., Lofgren, I. E., Sartini, B. L., & Greene, G. W. (2015). The green eating project: Web based intervention to promote environmentally conscious eating behaviours in US university students. *Public Health Nutrition*, *18*(13), 2368-2378. http://dx.doi.org/10.1017/S1368980015002396