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EECapacity, Cornell University, NAAEE**

20 LESSON PLANS FOR URBAN ENVIRONMENTAL EDUCATION

**Submitted by course participants
Course facilitator: Alex Kudryavtsev, PhD, Cornell University
EECapacity PI: Dr. Marianne Krasny, Cornell University**

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An Introduction to Urban Agriculture

Alicia Lodato of New Egypt, NJ



The Student Conservation Association

Image © Camden Children's Garden @ <http://www.camdenchildrensgarden.org/community-food-access>

Goal and Focus

Bringing awareness to urban community-supported agriculture (CSA) effectively engages students in the prospect of community and sustenance farming in an urban setting where access to fresh produce is otherwise limited.

This lesson plan focuses on Camden City in New Jersey, a city that has been designated a “food desert” due to its being largely neglected by major supermarkets. All references to urban gardens in the Camden area may be adapted for use in other locales.

The target age group is high school students 14 to 19 years of age but the content may be adapted for younger or older age groups.

Materials Required

1. Prior access to a computer is required for printouts.
2. Reliable transportation.
3. Reliable form of communication with on-site contact.

Activity Schedule

1. *Begin the day with a conversation regarding urban gardens.* Engage the students by asking if they have been involved in any sustenance-related gardening, and what the benefits are of producing one's own food. *Things to note:* Gardening in an urban setting is a cost-effective method of procuring fresh produce; gardening means knowing the processes involved in one's food/keeping out toxins such as pesticides and herbicides.
2. *Travel to an urban gardening site in which Camden City residents have already taken*

initiative, such as through the Camden City Garden Club, Inc., a nonprofit that organizes and aids citizens in gardening in vacant, city-owned lots (upon approval from the City of Camden). *Prior to the trip,* find an organization contact person who has experience familiarizing student groups with their organization's goals and purpose. Facilitate a dialogue between this site contact and the students; allow the contact to introduce the organization and project(s) present. If possible, allow students to engage with members of the community present.

3. *Engage in service-oriented work at the urban agricultural site,* such as weeding and mulching, as well as spreading compost.
4. *As a final activity, and to reinforce how urban green spaces can benefit the students on a personal level,* discuss methods of gardening that can be utilized in small (and even indoor) spaces, such as vertical gardens and potted gardens. These types of gardens may even be viable for yielding fresh edibles in the cold seasons. Bring handouts for vertical and potted indoor/outdoor gardens as well as seeds to help them get started.

References

- In the Community. (n.d.) *Camden Children's Garden*. Retrieved from <http://www.camdenchildrensgarden.org/community-food-access>
- Russ, A. (Ed.). (2015). Urban Planning and Environmental Education. In *Urban Environmental Education I* (pp. 36-38). Ithaca, NY and Washington, DC: Cornell University Civic Ecology Lab, North American Association for Environmental Education, and EECapacity Project.

Meaningful Watershed Education Experience: Watershed Station for 4th Grade

Ann Di Fiore, Green Spring Gardens, Fairfax County Park Authority



Learning Goal: Students will develop an understanding of watersheds, the impact of development, and how to be stewards of their watersheds.

Materials: Laptop and projector or maps of watersheds, Enviroscape model with “contaminants”—sprinkles, soy sauce, cinnamon, colored sugars, spray bottle.

Lesson: Step 1. We are all part of a watershed. Define a watershed. Discuss local rivers or streams and the larger watersheds into which they flow. Illustrate how elevation can determine the watershed of an area. Watersheds can be very small or cover several states. **Step 2:** Human activity in the watershed determines its health. Discuss water as a limited resource, using illustrations from the Drop in the Bucket Demonstration. Discuss practices that can keep the watersheds clean: i.e., picking up pet waste, reducing consumption of plastic bags, etc. **Step 3:** Using the Enviroscape model, demonstrate how rainfall in a forested area is absorbed by the trees’ leaves, branches, and bark, then falls on soil where leaf litter allows for slow, gradual absorption. Illustrate how farming, clearing of the land for roads, homes, and businesses displace soil, leading to erosion by wind and rainfall. Increased population introduces pollutants that impact the stream, and ultimately, the larger watershed. **Step 4:** Ask students for ways to improve the health of this watershed. Give examples of local efforts to clean watersheds and assure them that they can be stewards in their communities.

Suggestions: Let the students spray the watershed model to see what ends up in their waterway and set up the model for next use. Use/define these terms: runoff, wastewater, turbidity, sediment, and riparian buffers.

Justification: This lesson simulates the movement of water through an urban watershed, allowing students to visualize geological processes. The lesson is interactive, engaging students of multiple learning styles.

Exploration, Field Study, & Experience of the Native American Heritage Sacred Space in an Urban Wilderness Park @Leakin Park, Baltimore, Md.

Antonio Carpenter, CEO, METARO, Multicultural Education Training & Research Organization

Learning Goal

Middle school or high school, urban students will explore, observe, photograph, video record, and experience the world of nature and the cultural integration of the Native American culture in nature, in an urban wilderness park. These students will then personally reflect on their experiences, and record their experiences in a Nature Journal. Student will then discuss and compare their observations with those of other students. (Photo: Sacred Hopi Labyrinth)



Objectives

1. Students will practice Mindfulness Walking, in the Sacred Hopi Labyrinth, and upon arriving at the center of the Labyrinth, be seated, and write their reflections about the experience.
2. Students will participate in a Sage Smudging and Sacred Fire Ceremony, in The Sacred Cherokee Ceremonial Arbor.
3. Students will practice Mindfulness Walking as they hike the Eastern Woodlands Trail, observing and recording the rocks, plants and animals that they encounter.
4. After observing and experiencing each activity, students will go to the Sangoma Wisdom Teaching Circle to record their observations, reflections and experiences in their nature journals or smartphones, and then have a group discussion where they compare their observations and experiences with those of other students.

Materials

- Backpack, hat, water bottle, binoculars, magnifying glasses, hand sanitizer, healthy snacks
- Nature journal, pens, colored pencils, cameras, smartphones for pictures and recordings
- Observation and inquiry sheets for each activity

Orientation & Implementation

1. Students gather at the Sangoma Teaching Circle to be given background on each component of the Sacred Space, along with specific Observation & Inquiry Sheets for each activity.
2. Students will then explore, observe, experience, and record their experiences of each activity in the Sacred Space, in pairs, or in teams of 3-4.
3. When the activity has been completed, students will return to the Sangoma Teaching Circle to reflect on their observations and experiences, and to record them in their Nature Journal and discuss as a group.
4. At the conclusion of the day, students will sit in the circle in the Sacred Cherokee Stone Arbor to give their reflection of their overall experiences in the exploration, observation, and reflection of the Field Study of the Native American Heritage Sacred Space in the Urban Wilderness Park.
5. The educator will lead students in a “Giving Thanks” Ceremony where students will be shown how Native Americans consistently gave thanks to the Sacred Earth, and the Great Spirit for the bountiful gifts that the Sacred Earth had given them, and continues to give to them.

NAAEE Environmental Education Program Guidelines for Excellence

1.3 Openness to Inquiry: Involve Learners in collecting/ analyzing their own data & comparing it to other’s data. 1.4 Reflection of Diversity: Different Cultures are understood with respect 2.1 Awareness: Increase learner’s awareness of the natural environment.

Resources

1. Coyote’s Guide to Connecting with Nature (Young, Haas, & McCowan, 2009)
2. USFWS: Fostering Outdoor Observation Skills (Especially Unit 1 and Unit 4A)
(Unit 1:Lesson 3: Using a Science Notebook & Unit 4A: Lesson 2:Where & When to Look)
(<http://www.fishwildlife.org/files/ConEd-Fostering-Outdoor-Observation-Skills.pdf>)
3. Voices of Our Ancestors: Cherokee Teachings from the Wisdom Fires: Dhvani Ywahoo Shambala

Insect Safari

Ashley Kennedy, Delaware Nature Society, Hockessin, DE

Goal: *To impart a lasting appreciation and respect for insects and other arthropods.* Insects are an oft-overlooked and much-maligned component of biodiversity, despite their vital importance to virtually every ecosystem on earth. They are abundant even in the most urban of settings, so teaching children to consider insects “wildlife” instead of pests will give children a newfound appreciation for cities (which may be lacking in vertebrate diversity) as wildlife habitats. Insects are often given as a reason to avoid spending time outdoors (many people fear them because of the relatively few species that bite, sting, and are a disease vector)—through this lesson, students will learn that insects should be celebrated, not feared.

Target audience: 5-10 years old

Materials: Sweep nets & empty jars (e.g., peanut butter jars)—1 per pair of children. Access to an urban green space (park, community garden, etc.—anywhere you have plants, there will be insects!)

Activity: Spend approximately half the class time discussing the topics below, then the second half of the class looking for insect life “in the field” and sharing what you catch.

- **Introduction:** Ask if the students like or dislike insects and why. Also ask if they think insects are important and why. If they are stumped: consider insects’ roles as pollinators, as decomposers of waste, and as prey for other species such as birds, fish, mammals, reptiles, and amphibians.
- **Song:** To help the students remember the major body parts, we do a song and dance to the tune of “Head, Shoulders, Knees and Toes”.
*Head, thorax, abs and legs, abs and legs,
Head, thorax, abs and legs, abs and legs,
Eyes, antennae, mouthparts and wings,
Head, thorax, abs and legs, abs and legs!*
- **Pollination:** Explain what it is and how it is done. Emphasize that many of our important food crops are pollinated by bees, and bees also make honey. Urban backyards and rooftops provide good sites for beekeeping!
- **Collection:** Break the group into pairs and give each pair a net and a collection jar. Have them brainstorm before they start collecting—where should they look? Even in a city, you can find insects—on plants, crawling across sidewalks, flying through the air, burrowing in the dirt, etc. Tell them the boundaries of where they’re allowed to go, then let them loose to collect!
- **Identification:** After collecting for ~20-30 minutes, bring the group back together and ask each pair to share what they caught. Help them to identify the arthropods they caught. It’s OK if you don’t know what they all are—there are more than a million described insect species, so no one could possibly know them all!

References & Useful Links:

- Entomological Foundation educational links: http://www.entfdn.org/education_links.php
- Bug Guide (useful for identification & photos): <http://www.bugguide.net/>
- Insect Identification for the Casual Observer: <http://www.insectidentification.org/>
- Florida 4H Bug Club (useful info for children as well as parents and teachers): http://entomology.ifas.ufl.edu/bug_club/index.shtml



Urban Wild Edibles & Foraging Map

Brad Armstrong | Kensho SEED | New Haven, CT

Goal: To acquaint students with their local urban ecology, edible species identification, and geographic features of different species growth patterns.

Age: 20–100 years old. Adapt this activity for target audience.

Materials: pen/pencil and paper, species ID reference material (book or internet), plastic baggies for specimen gathering, map (paper or online).

Suggestions / Tips: It may be easier to research types of edibles, and then to explore the city with those in mind.



Look for human resource capital, in the form of local knowledge from older generations, or garden clubs or land trusts, folks that have knowledge of these types of species already.

Don't trespass on private property! Always ask permission to access first.

***Disclaimer:** DO NOT EAT ANYTHING YOU FIND (You do not want to be responsible for any new/unknown allergic reactions)

Activity:

- (1) Have the students study the reference materials to acquaint themselves with signs of acceptable types of edible plants.
- (2) Start to explore areas already familiar to the students, such as the area immediately around the school/organization, or around an individuals' house.
- (3) Keep records and collect samples. Mark the locations and species on a map.
- (4) How can you get other people involved, and tap into local knowledge in your community to expand this project? Talk to people from land trusts, schools, farms, and gardens. At the same time, keep the samples on the map wild!

Variations: Rather than starting with the plants themselves, see if there is an existing foraging map of your city/town and focus more on species identification, making this activity like a scavenger hunt.

References:

NAAEE Guidelines for Excellence in EE Materials:

- 1.2 Balanced presentation of differing viewpoints
- 2.1 Awareness
- 3.1 Critical & creative thinking
- 4.1 Sense of personal stake & responsibility
- 5.3 Connection to learners' everyday lives
- 5.5 Interdisciplinary (civics, geography, math, environmental studies)
- 6.4 Adaptable: can be used for various grade levels, and in various locations

Pollinator Salad

Donna R. Peppers

Goal: The goal of this lesson is to provide information regarding the benefits of pollinators in order to assist in the development of an environmentally conscious attitude. Specifically, the lesson is designed to develop an awareness of the dependence of butterflies and other pollinators on the green corridors in cities as they continue to influence food production and migration patterns.

Age: 5 to 8 years old. The lesson could easily be adjusted for a variety of ages.

Activity: (1) Read the book to the group. Have children identify various pictures in the book as they also note the various stages of the butterfly development. Emphasize the importance of the butterflies to expedite growth in urban community gardens as well as rooftop farms. Discuss the importance of urban involvement in assisting the pollinators by working on behalf of the insects. The students can use the knowledge to help support the pollinator population.



(2) Discuss the importance of how the butterfly helps spread pollen among plants. Discuss how pollination is necessary for the plant to produce flowers and fruits. Show pictures of bees, hummingbirds and various bugs and identify these as pollinators. Relate the new information to habitats that are specific to the urban environment, such as community gardens, green corridors and rooftop gardens. Discuss the need to assist in preserving current urban gardening endeavors and planning for new pollinator habitat expansion. The students could be actively involved in maintaining a current garden or creating and installing a garden that could be pollinator friendly.

(3) To further develop a sense of pollinator protection, present various fruits one at a time and reinforce the need for pollinators in order for the fruit to develop. Present chocolate as a food we would not have without the benefit of pollinators. Have students consider what action they could take, such as creating badges identifying themselves as Urban Pollinator Protectors, to help spread information regarding the need to provide precious pollinators with an urban friendly environment.

(4) Allow students to enjoy a fruit salad created from fruits made possible by the benefits of pollinators.

Materials: *Waiting for Wings* children's book, pictures of bees, hummingbirds, and small fruit bats, various fruits, chocolate and utensils for eating salad.

Suggestions / Tips: I always prepare the fruit salad ahead of time. When working with young children, it is difficult to maintain attention so pre-preparation is imperative. We also visit a nearby garden and look for various pollinators. I would suggest using various disposable items, such as a tire, and create a type of garden. Strawberry plants work well in this situation and will bring in various pollinators. Consider also participating in an environmental stewardship project such as one that monitors the flight of the monarch butterflies.

This lesson could serve as an initial activity for a unit emphasizing interdependent nature of the environment in an urban setting. Modifications could allow for use with multiple ages.

References

<http://ngm.nationalgeographic.com/2011/03/pollinators/holland-text>
<http://ngm.nationalgeographic.com/2011/03/pollinators/holland-text>
<http://www.fs.fed.us/wildflowers/pollinators/index.shtml>

Food Cycle: Where does my food come from and where does it go?

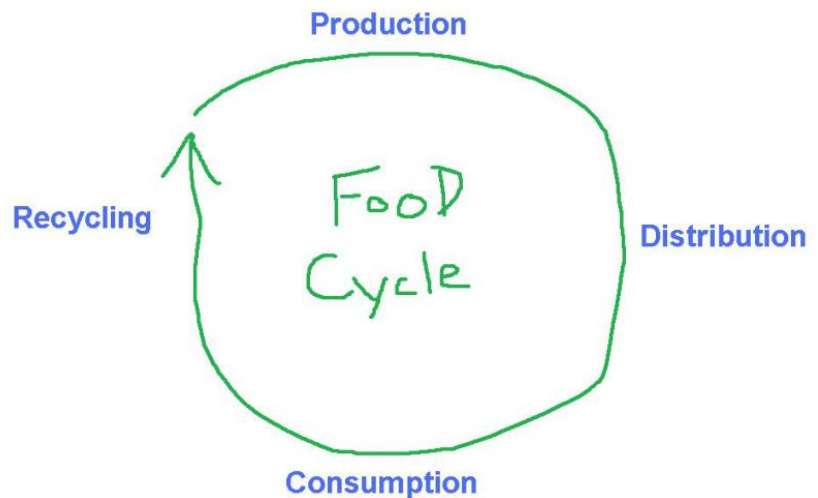
Galanda A. Bryan, Environmentally minded citizen, Baltimore, MD

Goal: To bring awareness to urban children that what we eat and how we dispose of it affects our environment. Many urban children eat a lot of fast food and processed food. They have little knowledge of gardens or farms, and often they live in “food deserts” with limited fresh food. They have no idea that many non-living things are by-products of living materials. Stimulating this thought process may facilitate better consumer behavior in the future.

Age: 7–12 years old

Materials: A notepad/paper and pen is all that is needed. The idea is to keep it simple and inexpensive. However, a few worksheets could be created as a guide (a log worksheet and a chart worksheet).

Activity: This activity can be used in after-school programs, summer programs and neighborhood association programs. It can even be given as an at home assignment by parents who want their children to be more aware of their environment. It is the role of the child to create a meal log. The facilitator/parent helps to guide the child to the types of information they should include on their food log. Additionally, they facilitate the discussion of the environmental factors that are captured in their log.



- (1) The child should pick one dinner meal to log.
- (2) They should note at least the following items (This is likely to require the child to “interview” an adult to answer some questions):
 - a. What they had for dinner (vegetables, meat, juice)
 - b. How each item was packaged (box, plastic bag, aluminum foil and if it was frozen, fresh or packaged)
 - c. Where it was purchased (store, farm, garden)
 - d. What was done with the remains (trash, recycle, compost)
- (3) Select one of the dinner items and draw a chart of the life cycle. Where it started and its progress through the time you ate it. The simple picture above can be used as a guide.
- (4) Discuss for each item on the chart, what part of the environment was affected. For example:
 - a. Was the item living or non-living?
 - b. If non-living were there any living things that were used to make it?
 - c. If it was living, what resources did it use? Water, sun, soil, energy, insects?
 - d. How do you dispose of living and non-living things? Does it matter?
- (5) Discuss how you (the child) can impact the things discussed by the choices you make.

Suggestions / Tips: Provide the children with an example such as having a granola bar for a snack. Describe that it came in non-living packaging (the box and the wrapper) from the grocery store. The granola bar was made up of oats, sugar, honey, cranberries, salt and flour. You put the wrapper in the trash and the box in the recycle. Further expand on this short description in that the box is made of trees, the oats and sugar are grown on farms, etc.

The importance of this exercise is that food choices not only have an impact on your health, but they also have an environmental impact. All things are related to one another, nothing is in a vacuum. The choices in urban (city areas) effect not just the city, but also the farms and companies where the food comes from.

References:

EECapacity. (n.d.). Retrieved March 28, 2015, from <http://www.eecapacity.net/>

National Environmental Education Week. (n.d.). Retrieved April 1, 2015, from <http://eeweek.org/>

No Impact Project. (2009, August 14). Retrieved March 28, 2015, from <http://noimpactproject.org/>

Price, A. (2011, July 17). What's Good in My Hood. [YouTube video]. Retrieved from <https://youtu.be/Mfh579rjio>

The Power of Pollination/ Social Change Through Service

Heather Lawson, Petal Share, Washington, DC



Goal: This lesson develops an understanding of grassroots philanthropy, community service and recycling in urban environments through the use of and engagement with fresh cut flowers and floral arranging.

Age: 8 +

Activity: Use the Petal Share model of community service and recycling to teach individuals in urban environments about flowers, recycling practices and fostering unconventional methods of philanthropy. The Petal Share model involves sharing flowers with individuals (and their caregivers) in Ward 8 DC nursing homes, hospice centers, battered women's shelters, homeless youth shelters, and transitional housing programs. The Petal Share "circle of service" starts with those who entrust Petal Share with transforming their cut flowers into recycled bouquets of joy. The circle is completed when our volunteers and donors feel the deep appreciation from those we serve, while those we serve are provided with a sense of comfort and happiness.

- (1) Introduce the concept of philanthropy. Teaching will emphasize that giving does not require large amounts of money or resources. Individuals will learn that philanthropy is not exclusive to a certain, elite demographic and that every day people can be philanthropists.
- (2) Introduce the concept of eco-stewardship as inspiration for change in urban communities. Teaching will focus on the process and technical aspects of the practice of urban environmental stewardship and how micro-efforts have the ability to make meaningful change.
- (3) Introduce concepts related to conservation, socially responsible and eco-friendly use of natural environments in urban communities. Teaching will shift to the use (and re-use) of fresh cut flowers.
- (4) Introduce concepts related to recycling as a form of community service. Teaching will emphasize how to prevent waste of potentially useful materials by transforming them into community service tools.

Materials: Fresh cut flowers, lesson plans, guest speakers, flower arranging tools.

Suggestions / Tips: Introduce all lessons in a hands-on & accessible manner.

References:

<http://facebook.com/Petalshare>

<http://www.scientificamerican.com/article/environmental-price-of-flowers/>

<http://livingphilanthropic.tumblr.com/post/2449581218/tips-for-the-everyday-micro-philanthropist>

Edible Rock Cycle

Jeanne McVey and Shannon McVey



Goal: This lesson is designed for urban elementary and middle school students with prior knowledge of the three rock types and a general idea of the rock cycle. The objective of this lesson is to have students model the rock cycle with hands-on, edible manipulatives. It will help urban students better understand how Earth's surface is constantly changing, make them aware of how their surroundings have come to be, and explain the processes that cause their environment to change over time.

Age: 8–12 years old

Activity: (1) Start by explaining that everyone will be modeling how one rock type changes into another rock type (the rock cycle). Begin by handing each student a Ziploc bag with two unwrapped Starbursts in it (preferably of different colors). Tell students that these two candies each represent igneous rocks. You will now model how igneous rocks turn into metamorphic rocks.

(2) Instruct students to unwrap the two Starbursts and put them in the closed Ziploc bag. Tell them to rub their hands together for 30 seconds as fast as they can (time them using a clock or stop watch). Immediately after, instruct students to push down on and smash their Starbursts together for a minute or two. You should see the two Starbursts mixing together and forming one solid shape. The friction and pressure from our hands represents the heat and pressure of the mantle inside the Earth. Because of the heat and pressure, the igneous rocks are now a metamorphic rock.

(3) Distribute a mini box of Nerds candy to each student. Ask them what they think this might represent. Instruct them to pour the Nerds into the bag and smash and squeeze the Nerds and the Starbursts together. Explain that the Nerds represent sediment. A sedimentary rock is formed when sediment (bits of weathered rock) is squeezed together over time. Because of the sediment getting squeezed together, the metamorphic rock is now a sedimentary rock.

(4) Ask students what must happen for a sedimentary rock to become an igneous rock. An igneous rock is formed when magma cools inside or outside of the Earth. In order for a sedimentary rock to become an igneous rock, it must melt into magma first. Ask students how they could melt their sedimentary rock

If you have access to a microwave, show students what happens if you microwave the sedimentary rock for 20-30 seconds on a paper plate. The microwave represents Earth's mantle. The Nerds and Starbursts melt into what represents magma.

Once the magma cools, it is an igneous rock. If you do not have access to a microwave, you could send the rocks home with students to try out themselves. Make sure you make it clear that they must take the rock out of the bag and put it on a microwave-safe plate before they microwave it.

(5) Debrief by asking students the following questions: What did rubbing your hands together represent? What does it take to go from an igneous rock to a metamorphic rock? Where on Earth would you find this type of rock? What did the Nerds represent? What does it take to create a sedimentary rock? Where on Earth would you find this type of rock? What does the microwave represent? Where on Earth would you find igneous rocks? How do rocks change over time? What causes these changes?

Materials: Small plastic Ziploc bags (1 per student), Starbursts candy (2 per student), miniature boxes of Nerds candy (1 box per student), paper plates, microwave (if accessible; not absolutely necessary)

Suggestions / Tips: Always inquire about food allergies before doing any demonstrations that involve edible materials. To save time, I suggest modeling the final step of the rock cycle (microwaving the sedimentary rock in the microwave) with only one or two edible "rocks" and showing the final result to all students. Students typically enjoy snacking on these tasty rocks!

Try conducting this lesson in an urban park where rock formations have influenced how a city and its structures are built. Many urban parks have different types of rocks right on the surface. The type of rock can affect what type of structures can be built in an area.

Resources: Student resource (slide shows and videos about the three rock types, weathering and erosion, and the rock cycle):
<http://studyjams.scholastic.com/studyjams/services/search-results?query=rocks>

Grades: K-3, can modify for older groups

Goal: Students will gain an understanding of habitats and what basic needs a habitat must provide.

Objectives

- Students will identify habitats and the necessary resources for survival.
- Students will identify how humans can affect and change animal habitats.
- Students will learn simple action steps they can do to help save animals.

Guidelines for Excellence

Early Childhood EE Programs:

Key Characteristic 1

1.1 - Focus on nature and the environment

1.2 - Focus on education of young children

Key Characteristic 2

2.2 - Authentic experiences

2.3 - Child-directed and inquiry-based

Key Characteristic 3

3.1 - Use of the natural world and natural materials

Key Characteristic 4

4.1 - Social and emotional growth

4.2 - Curiosity and questioning

4.3 - Development of environmental understandings

4.4 - Skills for understanding the environment

Key Characteristic 5

5.1 – Spaces and places to enhance development

5.2 - Natural components

5.3 – Comfortable for both children and adults

5.4 - Health, Safety, and Risk

Key Characteristic 6

6.4 – Planning and implementing environmental education

6.5 - Fostering learning

NJ State Standards	5.1, 5.3A, 5.3B, 5.3C, 5.4G
PA State Standards	3.1 A2, 3.1 C2, 3.1 C3, 4.1 A, 4.1 C, 4.1 D, 4.1 E, 4.4 A, 4.5 C, 4.5 D
NGSS	K-LS1-1, K-ESS2-2, K-ESS3-1, K-ESS3-3, 2 LS4-1, 1-LS1-1, 1-LS1-2
Common Core	CCSS.ELA-LITERACY.RI.4, CCSS.ELA-LITERACY.RI.8, CCSS.ELA-

Animals and Their Habitats

Author: Jessica Grill

Based on Philadelphia Zoo habitats lesson

What is a habitat? (pose this question to the class)

- People and animals have something huge in common – they must live somewhere. But all animals cannot live everywhere. Each species, or type, of animal needs a particular home, known as a habitat. This habitat must provide four essential things – food, water, shelter, and space.
- For people, a habitat might stretch from their home (where they have water and shelter), to the supermarket (where they buy food). All the places people go to get what they need to survive can be considered part of their habitat. Different living things have different needs for food, water and shelter, so each kind of animal or plant has a specific kind of habitat.

Activity: Build-a-Habitat

- Pre-class preparations
 1. Print out pictures of animals, including those found both in the city as well as local wildlife that can be found outside the city. A plush animal can be substituted for the pictures.
 2. Create two basic habitat designs – one of an urban neighborhood scene, another of a woodland scene. There should be enough for all the students. They will be drawing on these.
 3. Print or cut out example pictures of various items an animal would need and not need in their habitat (e.g., - proper and improper foods, natural and man-made shelters, garbage, etc). This should be displayed for the students to see.
- Tell the class you are going to show them a picture of an animal, and they are going to design a habitat for it based on some facts that you will provide them.
- Each student will have a basic habitat design. Instruct the students that they will be shown an animal and they should draw what they think the animal needs to survive and where they can find it in the habitat they were given.
- After they are given those instructions, you should give out the facts about the animal that relate to its habitat needs.
 4. How do humans impact habitats?
- Have students think about a good habitat for themselves. How can you tell that you are comfortable in your habitat? What things do you think you need in your habitat? Are they the same or different than what animals need?
- Explain to the class that while we cannot ask an animal if they have all they need in their habitat, we can look for the presence of animals and observe their behavior.

Discussion points:

Why must animals have a proper habitat?

What do you think the habitat around the school would have looked like before the school was built? What about your neighborhood? The entire city?

What small habitats can we find around the school? What large habitats can we find in the city?

What can you do at home to help provide habitats for animals?

Further activities and resources to build on this topic:

Habitat Web Activity - http://happeninhabitats.pwnet.org/pdf/Habitat_Web_Activity.pdf

Animal Habitats! By Judy Press - <http://www.amazon.com/Animal-Habitats-Learning-America-Williamson/dp/082496778X>

City Park by Wendi Davis - <http://www.scholastic.com/teachers/book/city-park-0>

The Picnic Recycle Lunch

Julie Graham, Austin, TX

Goal: In urban areas trash often litters the streets. Student will learn to dispose of trash in the appropriate recycle bins after having a picnic in an urban park. This meets the curriculum requirement for Texas Teachers (TEKS Kb1C).

Age: Pre-K - Kindergarten

Activity:

1. Plan a field trip to an urban park for the class with an area that has a play lawn for running, shady area for a story time, picnic tables and recycle bins close by.
2. Let children play for a bit then take them to the recycle bins. Discuss what recycle bins are used for.
3. Read two stories that are appropriate recycle picture books for children. Try to find stories that have an urban setting. Let children know to save all their trash from lunch. Tell them they will sort their trash and then put it into the correct recycle bins.

Once lunch is finished have everyone get in a circle with their trash from lunch. Talk with children about the different types of trash they have. Ask students if they have seen this type of trash littering their city sidewalks. Explain that trash can be sorted and recycled. Teacher will start different piles of trash and children will then put their trash into the appropriate piles with help from teacher as needed. Emphasize to children how much trash was gathered by not using re-useable containers. Tell them that sometimes it isn't always possible to use re-useable containers and that is okay as long as trash is recycled correctly. As the group takes trash to recycle bins let every child have a chance to put trash into the correct bins.

4. After finished, enjoy the play area. Have everyone check the areas where they played to be sure they didn't leave any trash. Then head back to home base.



Materials:

Permission slips for field trip, first aid kit
Student information, blankets to sit on during story time
Picture books about recycling for young children
Paper towels/hand sanitizer
Cooler for lunches/ice for cooler, lunches

Suggestions/Tips:

Flexibility is the key to working with young children.

References:

- Texas Education Agency, Texas Essential Knowledge and Skills for Kindergarten, Science Kb1(C): demonstrate how to use, conserve, and dispose of natural resources and materials such as conserving water and reusing or recycling paper, plastic, and metal.
- North American Association for Environmental Education. Early Childhood Environmental Education Programs: Guidelines for Excellence. Washington, D.C. NAAEE, 2010. Guideline 4.5-A Personal Sense of Responsibility and Caring.

Group map

Lan Tran, Student Conservation Association, Pittsburgh, PA



Goal: Participants develop a shared sense of place as a group of people who work together over an extended time (i.e. class, community service group).

Age: Middle to High school age

Activity:

- (1) Participants draw a map of their current neighborhood with landmarks of significance to them.
- (2) Everyone presents their neighborhood map to the group.
- (3) Together they figure out where each person's neighborhood is in relation to each other geographically, and position the drawings accordingly onto a large sheet of cardboard.
- (4) Hand out pictures from service projects or events where they've been together and let them figure out where those belong on the map.
- (5) Allow participants to add other landmarks that have special meaning to the individual, family, or the group. This can be ongoing as they continue to notice them in their community.

Materials: Sheets of paper, drawing utensils, large cardboard, tape.

Suggestions / Tips: Use different colors for drawings vs group places vs family significance etc. Allow participants a chance to notice the features that are near or far from their homes. Ask why they have noticed some things but not other things that their peers might have added. Encourage participants to explain why certain features in their community are significant to them.

References: Akiima Price. What's Good in My Hood; David Sobel. Sense of Place Education for Elementary Years. 1997.

Food Miles Traveled – Making the case for Local Food

Lauren Levinson, Northbrook School District 28, DePaul University MA Sustainable Urban Development

Go to nearby grocery store.

Fill in the chart below:

- 1) Food type: Find 2 Meats, 2 Vegetables and 2 Fruits
- 2) List the Name – Is it Organic/Non-Organic?
- 3) List the City it was grown in
- 4) Go online and search the miles from that city to the grocery store
- 5) Local means that food is produced within 250 miles. Is your food local? Write yes or no

Food type	Name	City grown in	Miles Traveled	Is it “local”?
Meat 1				
Meat 2				
Vegetable 1				
Vegetable 2				
Fruit 1				
Fruit 2				

What can you do to eat more “local” foods?

- 1) Go to a Farmer’s Market in your city – here farmers from in your region come and sell produce directly to consumers. Meet your farmer: ask how far they traveled to get here, whether or not they are certified organic, why non-organic food can be safe for health and the environment too? If not, why not?
- 2) Sign up for a CSA – CSA stands for Community Supported Agriculture. You can get a box of fresh fruits and vegetables every week from farmers in your region. CSA boxes can be picked up from a central location and sometimes can be delivered right to your home.
- 3) Grow your own! A great way to shorten the farm to table process is to grow food at home or at a community garden. Get your hands in the dirt and sow your own seeds – your veggies will taste better than ever!



Where we Live: Our Local Water Bodies & Their Natural and Cultural Heritage & Ecosystem Functions

Lisa Mendelson, leader for Junior Girl Scouts, Fairfax County, VA

Goal: *Discover and connect with the human and natural history of several water bodies in our urban watershed.* Students (Girl Scouts) will understand the dynamic urban ecosystem in which they live, and will be inspired to take action to improve it.

Background: This multi-meeting lesson plan of 4 meetings uses the Girl Scouts approach of Explore, Connect, and Take Action. The program will be conducted over several meetings (usually one meeting every 3 weeks for approximately 3-4 hours each time) and will be presented by several parents in conjunction with self-led work undertaken by the girls.

Target Audience: 4th grade Junior Girl Scouts with a strong science and natural history background. Would also work with younger or older students when scaled appropriately.

Alignment with Girl Scouts badge program: Currently the Girl Scouts do not have a junior-level badge that aligns with this work. However, there are several legacy (old 1970s) badges that are still available through 3rd parties that we may use to recognize their work when completed.

Lesson/meeting/site visit 1: The Upland Creeks

Time needed: 3-4 hours

Outcome: Discover two creeks, their roles, natural history, and human history.

Supplies needed: Girls: rain boots, notebook, hiking sticks, camera to document conditions, snacks/water, binoculars (optional); Leader: small trash bags and rubber gloves, water monitoring kit, pH test strips.

Pre-trip work at home: Look at these documents online, focus on the maps and purpose and summary.

http://www.fairfaxcounty.gov/dpwes/watersheds/publications/cr/05_ca_wmp_ch2_ada.pdf

<http://www.deq.virginia.gov/Portals/0/DEQ/Water/TMDL/holmestrippsp1.pdf>

Discover: What watershed are we in? Is it a subwatershed of a larger watershed? Why is this area/these woods protected? What clues do we have into its past? How old are these trees? What was here before this was a park? What's happening here now? What pollution could be in these waters and what would the source be? How can we clean these waters? Why would we want to clean these waters? What living creatures are in these woods? Who else uses these woods? For what purpose? What changes occur here seasonally? Discuss various strategies for protection of watersheds.

Connect: Field activities: (1) using pH test strips and the monitoring kit compare the two creeks and record data for comparison in the following lessons. What conclusions can we draw? (2) Keep a field log/diary of all taxa seen or heard.

Reflect: What did we see here and how do we think it affects water bodies downstream.

Take action: Be prepared to pick up trash along our hike and decide how to be involved in development decisions.

Post trip homework: Determine the size in acres of the two sub-watersheds. What watershed and sub-watershed do you live in? What impacts it? How does our all-taxa list compare with the Christmas Bird Count data for that area?

Discover three unique facets of our watershed, each on site, and the roles each play:

- (1) The upland creeks;
- (2) A man-made lake;
- (3) The downstream creek fed by the lake;
- (4) Two channelized creeks and a water treatment plant.

Each meeting/site visit will incorporate World Water Monitoring activities into the meeting specific site visit. Why do we monitor water quality?

It allows us to pinpoint any changes or trends that appear in water bodies over a period of time. These can be short of long-term developments. To identify any existing problems, or any issues that could emerge in the future. To measure the success of pollution prevention and reduction efforts. Many legal requirements exist for water quality goals, monitoring data is used to determine how well they are being met.

What other reasons might we have for monitoring? How are we using these waters? What development is happening in our watershed? How can we learn more about future development?

Vocabulary

Turbidity

TMDL

Point Source

RAPS

Stormwater Management Plans

Watershed Management Plan

Low Impact Development

Urban Biodiversity



An Urban Ecosystem Inventory

Michael Reinemer, Plant NoVA Natives and The Wilderness Society, VA

Summary:

Students inventory their community for the abiotic and biotic components to understand how they affect the health of the community for people and for the ecosystem.

Context:

The grade school through high school urban students in the program face a number of challenges and distractions and environmental health is not always a high priority in their lives.

Materials Needed:

Notebooks, map of local community and a city or regional map, reference guide book for local trees and plants.

Goals:

Explain and demonstrate how to make basic observations about the community and record the observations or data.

Guide students through activities designed to enable them to make observations, identify plants and animals, and describe how biotic and abiotic components interact in their communities.

Enable students to discuss their findings and draw conclusions about their observations, and find additional resources that could help them effect changes in their communities.

Lesson Activities:

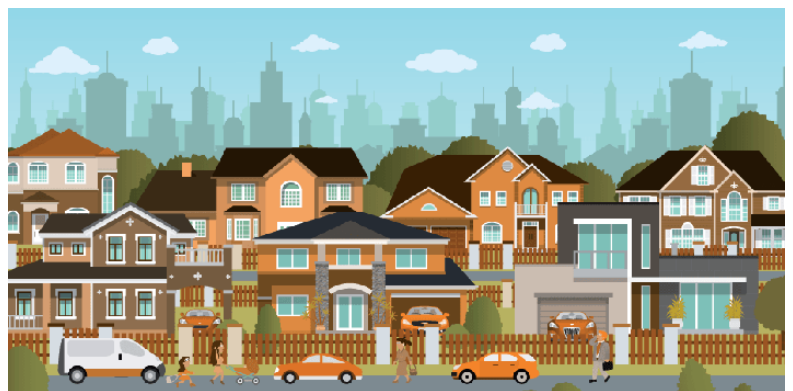
Inventory plants. List the trees, grass, forbs, garden vegetables and other plants in a representative, prescribed section of the community. List as many species as possible. Do the plants provide shade, food, beauty or other benefits? What is their impact on the community?

Inventory animals. List the birds, mammals (including pets), insects and other animals in the same prescribed part to the community. What is their impact on the community?

Assess water and climate. What happens to rain fall or snow melt? Does the ground absorb it or does it run off? Where does the runoff go? Is the runoff clean or polluted? What is the impact of the runoff on downstream communities?

Discuss findings: Display and discuss findings. What impressions do the students take away from the activities? Can they compare their community to similar communities?

Draw conclusions: Are there improvements that could be made to the biotic or abiotic components of the community? How could the quality of life and quality of the environment be improved? If so, how would the improvements be made? What are local government or private organizations that could be resources to help effect change?



Planning and Planting Your First Urban Garden

Micheline Hynes, Katey Rudd, Becca Smith, and Carol Marin

Tarrant Area Food Bank's Learning Garden, Fort Worth, TX



Goal: Participants will understand and have practiced the basics of planning and starting a raised-bed garden using the square-foot gardening method and organic principles.

Age: 15 years and older

Suggestions / Tips: Lesson takes approximately 3 hours. While this lesson can be taught anywhere, it is highly suitable for urban environments where in-ground beds may not be possible, and where people may have little to no previous gardening experience.

Activity:

1. **Discuss Site Selection.** Show participants raised beds at training location and ask them to consider the following regarding their own space:
 - Where is the best location for the garden in the space you have?
 - Is 6-8 hours of full sun and easy water access readily available?
 - How quickly does water drain and where does it go?
 - What accommodations might need to be made for less than ideal sun, water, soil, or high winds?
 - Using page 4 of the Garden notebook, have participants think through bed size and placement.
2. **Discuss and Demonstrate Preparing Garden Beds.** Tell/show participants the basics of:
 - Identifying native soil type/obtaining good fill soil.
 - Choosing amendments to improve soil tilth.
 - Benefits of composting and mulching utilizing the lasagna method of layering cardboard and newspaper, pine needles (instead of non-renewable peat moss), dry leaves, manure, compost, and ashes from untreated wood.
3. **Discuss Seasonality.** Tell/show participants the basics of:
 - Area growing seasons (Spring, Summer, Fall and/or Winter).
 - What to plant when for your region, available sun, water, and other factors specific to the location.
 - Direct sowing vs. indoor seed starting.
4. **Discuss and Demonstrate Square-Foot Gardening.** Tell/show participants the principles and benefits of:
 - Raised beds for small, urban spaces such as yards, rooftops, alleys, even sidewalks or vacant lots.
 - Companion planting and plant rivals.
 - Demonstrate Square-foot gardening using page 5 of the Garden Notebook and spacing templates.
 - Show various methods (templates, string, guides)
5. **Complete Hands-On Activities:**
 - Demonstrate and lead a quick-build bed by dry stacking found objects (bricks, stones, pavers, etc.).
 - Practice the “lasagna” method for building healthy soil.
 - Encourage participants to practice planting seeds following package directions and giving extra consideration for planting depth using the square-foot templates in the raised bed they built and filled.

Materials:

- Garden Planning Notebook (Suggest <http://frugalliving.about.com/od/gardening/ss/Printable-Garden-Notebook.htm>)
- Square-foot seed spacing guides
- Seed packets (various types, appropriate for the planting season and climate)
- Soil and amendments for lasagna method demonstration (depends on region and soil type)
- Bricks, stones, pavers or other materials to build a 4x4 raised bed, 2 feet high
- Handout: Recommended Planting Dates (for local climate)

References:

Identifying native soil: <http://water.epa.gov/polwaste/nps/upload/app6.pdf>

Selecting good fill soil: <http://eartheasy.com/blog/2014/04/3-useful-soil-mixes-for-planters-and-raised-beds/>

Choosing Amendments: <http://www.ext.colostate.edu/pubs/garden/07235.html>

Square Foot Gardening: http://www.howtogardenadvice.com/garden_info/square_foot_gardening.html

Lasagna Method Composting: <http://organicgardening.about.com/od/startinganorganicgarden/a/lasagnagarden.htm>

Utilizing Mindfulness to Promote Sense of Place in Urban Natural Environments

Robert Withrow-Clark, California

Introduction:

Urban gardens and farms are fast becoming a great way to introduce urban youth to sustainable urban agricultural practices, plant and animal science, community development, and entrepreneurship. Urban gardens and farms also create appropriate environments for reconnecting urban youth to the natural world through sensory awareness and mindful practices, teaching youth to slow down, be present, and create deep connections with urban spaces. Such experiences elicit emotion – a powerful component in developing *place attachment*.



Birds – Nature’s Sensory Awareness Teachers

Youth are given a notebook/sketchpad, colored pencils and a packet of stickers (8-10 stickers per youth). With supplies in hand, ask youth to find a place in the garden/farm where they are to sit alone. Depending how big of a space you have, the distance between participants will vary. The purpose is to give the children some “alone time” in nature (an urban “solo”). Instruct the children to not engage with their peers during the solo. Once children have found their solo location, ask them to sit comfortably. During the various activities listed below, the facilitator(s) should walk around providing cues if needed, but ideally will allow the children to have as much solitude as possible.

Instructions:

1. In their designated solo spots ask the children to use their **sense of sight** to find birds within the garden/farm. Ask them to draw, sketch, and/or color what they see.
2. Next, ask the children to close their eyes and **listen** for bird **sounds** (songs). On a sheet of paper the children will place a different sticker representing a different type of bird sound (they can open their eyes to do this, but then close their eyes once again to continue listening. Youth are to only place a particular sticker that represents a particular bird sound ONCE, and any time they hear that particular sound again, they place a check mark next to the sticker corresponding to that sound. For example, if they hear the same bird sound 4 times, they would have placed one sticker and 3 check marks next to that sound. It is recommended that the youth place stickers vertically in a column as they hear new sounds – and placing their checkmarks next to each sticker accordingly.

**Explain to the children that this is not a test, and that they do NOT need to identify “what kinds” of birds they hear, rather you want them to focus on the different sounds and how many birds are present in an urban natural space.
3. After the hearing sensory awareness activity, ask the students to use their **sense of smell**. They can get up and smell things within a 10-foot radius of their solo spot (again this may vary according to the size of your space). In order to connect it to the birds, ask youth guiding questions like, “how do the smells you are experiencing connect to the birds at the garden/farm?” Children may provide answers such as, “the flowers I smell are important for pollination, and some birds (hummingbirds) are pollinators.” Here the facilitators need to be creative – the purpose of this activity is to one, engage youth in sense of smell awareness, and two, connect these experiences to the birds at the location (interconnectedness or systems thinking).
4. Next have the children use their **sense of touch**, again within a 10-foot radius. This is an opportunity to touch plants, bugs or if they are lucky, find bird feathers. This is a great way to get youth to critically think about how birds are connected to their urban worlds. When the youth touch a stick, they may make the connection that the stick could be used to build nests. The touching of a worm may start a conversation about how this is food for the bird, but also an important component to soil health. Ask children to journal their experiences. Again, this activity is utilized to develop a sense of awareness, as well as promote a deeper connection to a place while engaging youth in urban environmental education at the same time.

ECO-JOURNALISTS: EXPLORING THE UNEXPECTED

Urban Environmental Education | Sarah Burroughs | 2015

PROGRAM GOALS

- Students will create Eco-Journals to use during the program (these can be used in the future if this is a series.)
- Students will explore their local community and identify flora, fauna, and other aspects of nature through personal observation and guided instruction.
- Students will foster a personal connection (empathy) with the local environment.
- Through empathy, students will be more encouraged to participate in environmental stewardship.

LEARNING OBJECTIVES

- To bring awareness to the existence of nature in *all* urban locations, especially ones' community.
- To inform students what nature (flora, fauna, etc.) can be found in their community.
- To encourage community engagement and stewardship through environmental literacy/empathy.

NAEE GUIDELINES

4th Grade: Strand 1 A, B, C, F, G

MATERIALS

- Composition books or board/paper/string to make journals
- Coloring materials & pencils
- Trash bag & collection containers (margarine/whip cream containers, plastic jars with holes in lids, etc.)
- *Optional: Collection tools such as trowels, butterfly nets, sweep nets, or dip nets*



LOCATIONS/STATIONS

Choose two community locations within reasonable walking distance but out of sight from one another. Both must have space to sit in a group and to explore freely:

1. Heavily urban, such as a wide sidewalk along a quiet street, public plaza, or paved lot surrounded by buildings.
2. "Natural" space, such as an urban park, piers, or community garden.

ACTIVITY

1. Sit in a circle. Pass out journal and coloring materials and give the students 10-15 minutes to design their journal covers (make sure their names are on them!)
2. What do students think of when they think about nature? What do they expect to see today? Discuss and draw/write in journal.
3. Ask students to identify aloud what they see. Journal each thing listed as natural or human-made.
4. Have everyone close their eyes, *listen silently* for ~5 minutes, and then write what was heard—natural or otherwise!
5. Discuss which sounds were natural and which were not. Were there any unexpected natural or human-made sounds?
6. Break the students into an even number of small groups/pairs. Half will find natural objects, half will find man-made. What do they expect to find? Where will they find it? Hand out collection materials (provide instruction if necessary). Give students 15-20 minutes to collect, then discuss and journal what was found. Define and emphasize biodiversity, niches, relevant cycles, ecosystems, and human impact on these ecosystems.
7. Return items/animals before leaving the station, but take this moment to evaluate which man-made materials can be returned and which are litter (to be kept in a trash bag). **At your discretion, allow students to press/keep items such as flowers and leaves for their journals. They could also do rubbings of what they find so it can be put back.*
8. Travel to Station 2. Take the walk there as another teaching and trash collecting opportunity if possible.
9. *Repeat steps 3-6 at Station 2.*
10. Discuss/journal the difference between both environments. What were the students surprised to find? Did they find/not find something they expected to see? Can they think of any other unexpected natural things in their neighborhood? Are there things in their neighborhood that do not belong there (i.e. litter) and what can they do about it?

EVALUATION/ASSESSMENT

Ideally, students should be taken to another heavily urban station (3) last or assigned to choose their own for homework. Journals can be temporarily collected after the program or series and evaluated based on the findings for all stations.

REFERENCES/RESOURCES

Excellence in Environmental Education: Guidelines for Learning (K-12), NAEE
<http://resources.spaces3.com/47edc444-7bd4-4093-918b-7964644cce75.pdf>

USFW: Fostering Outdoor Observation Skills (Especially Units 1 & 4B)
<http://www.fishwildlife.org/files/ConEd-Fostering-Outdoor-Observation-Skills.pdf>

Pocket Naturalist series (small laminated guides for easy carry/reference)

http://www.waterfordpress.com/index.php/component/option,com_catalog/Itemid,39/id,1/task,showType/

iBird field guide app, Mitch Waite Group <http://ibird.com/>

The Food Less Traveled

by Stephanie Ung

Objective: Students will...

- Explore their personal relationship to food
- Think critically about the environmental and social impact of their food choices
- Become more familiar with food systems and their role as a consumer

Time:

- 60 minutes

Age Group:

- Grades 9-12; Adults

Materials:

- 8.5"x11" paper per student
- Writing & coloring utensils
- White/Chalk Board

Dissecting food cultures, food choices, and food locality (influenced by "Organic, Slow, and Local" by Sarah Kavanagh and Holly Epstein Djalvo via The Learning Network of *The NY Times*)

Introduction:

Many students do not have complete control over where their food is coming from or what they are eating. However, they do have the power to become more aware consumers and think critically about where the food is coming from, how it is produced, and who is involved in the process. Because people have various values placed on foods, students will learn about each others' cultures around food. Allowing students to dive into how their favorite foods are made will bridge the gap between producer(s) and consumer.

Procedure (50 mins):

1. **5 minutes:** Begin a discussion about "food culture." What is culture? What might influence a person's "food culture?" Encourage students to think about how customs such as table manners, asking for seconds, and grace before a meal are also part of a food culture. Everyone has their individual preferences and there is no right or wrong way to think about food.
2. **10 minutes:** On their piece of paper, students will illustrate how food is integrated into their daily lives: Where do you like to eat and who is there with you? Are meals often eaten with family or friends? What foods make you feel most at



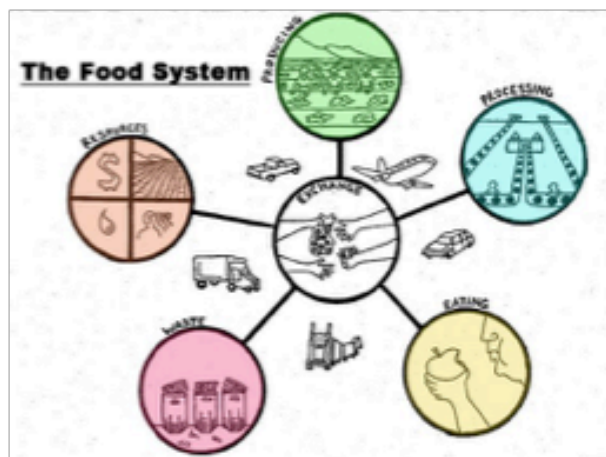
home? How are foods different or similar with different groups of people? How are food options different when school is in session (lunch vs. spring break)? Do you have any dietary preferences or restrictions? The point of this is to create a visual representation of how their relationship with food affects their food choices.

4. **25 minutes:** Have students select one of the meals they drew; each student will "dissect" the meal into ingredients required to make it. Next to each ingredient, have students think about where that food item grows or is produced, where might that be, and how it got to their plate. Also, who is involved in getting food items to their plate? Are the ingredients first packaged and shipped? From where? As students expand the history of their meals beyond the plate, the larger agents and impacts become more apparent.

3. **10 minutes:** Think, Pair, and Share—have students turn to a partner and spend 3 minutes each describing their food illustrations. Regroup and record similarities/ differences between pairs, as well as trends among each other.

Conclusion (10 mins):

Debrief and reflect: Discuss local options in your neighborhood; how could foods that have "traveled further" be replaced with locally-produced items? Local food systems are not necessarily organic; organic does not necessarily entail a smaller carbon footprint. Explore these concepts further with students and determine which aspect they value most and build on that momentum.



http://en.wikipedia.org/wiki/Local_Food#/media/File:Foodsystem.jpg

Flowers and Pollinators in the City

Vera Figueiredo, University of Maryland Extension, 4-H Youth Development

Level: 1st to 3rd Grade

Objectives

Students will...

1. Identify the parts of a flower and understand their function.
2. Understand the importance of pollinators.
3. Identify the diversity of pollinators within their community.

Key Terms

- Flower
- Pollinators
- Pollen
- Nectar

Materials:

- Flower Puzzle (homemade kit)
- Flower Model and/or Dissected Flowers
- Pictures of local pollinators
- Paper
- Pencils

Time (minutes)

Overall	60
Engagement	10
Explanation	10
Exploration	40

Background Information

Knowing that flowers need specific pollinators to reproduce, how is plant diversity maintained in cities where there may be low diversity of pollinators?

This lesson is designed for students to explore why we need pollinators and how to help attract them. This lesson may lead to starting a schoolyard garden or container garden, working with beekeepers to install a rooftop beehive, and teaching local residents the importance of pollinators and how they can attract them to their properties, etc.

ENGAGEMENT

Leading Questions:

- What is a flower?
- What do flowers need to grow?
- Are there many flowers in the city? Where?
- Does the city have what flowers need to grow?
- Are flowers important? Why?



ACTIVITY

- *Build a Flower:* Have youth work together to build a flower out of the foam parts in the kit. Then, compare puzzle to flower model and/or dissected flower. OR
- *Draw a Flower:* As a class, draw a large chalk flower on pavement to illustrate different parts of a flower.

EXPLANATION

Discuss different parts of a flower (petals, sepal, stamen, and pistil), emphasize the process of seed production. Include why we fear some pollinators and the importance of pollinators and nectar (for flowers and humans).

EXPLORATION

Once youth have a concept of flowers and pollinators, have them work in groups to conduct a pollinator inventory in: schoolyard, urban park or garden, and vacant lot. Compare amount and different species of pollinators found in all locations. Do we have enough pollinators? What can we do to attract more pollinators?

EXTENSION

- Start a schoolyard garden or container garden to help attract pollinators.
- Field trips to beekeeper, urban farmer, butterfly pavilion, greenhouse, etc.

RESOURCES

Carlson, C. 2010. Growing Healthy Habits. University of Maryland Extension. Food Supplement Nutrition Education Program. md.nutrition-education.org

2008. Pollinator Activity Book. University of Illinois at Urbana-Champaign. <http://www.life.illinois.edu/entomology/pollinators/docs/Pollination%20Activity%20Book.pdf>

2001. Pollinator's Journey. National Wildlife Federation. http://nieonline.com/downloads/national_wildlife/wildlife/pollinator_k8_2.pdf?CFID=21829593&CFTOKEN=45043161