25 LESSON PLANS
FOR URBAN ENVIRONMENTAL EDUCATORS

Selected lesson plans developed by participants of the “Urban Environmental Education” online course
April 10 – June 4, 2017

Cornell University Civic Ecology Lab

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URBAN SOUND MAPPING

Xuan Gu and Bo Wang
Pro-Nature Education and Research Center (China)

Objectives:
- To build community members’ connection with the community and the surrounding environment;
- To foster a sense of place in a community and bonding within community members through art and storytelling;
- To provide an approach for community members to meet, talk, and share in a natural and safe way.

Participants:
- Community members aged 12 or above, with no problems in hearing and able to use pen.

Number of participants: 15-25.

Time: 2 hours.

Venue: A public park in a community. Choose a site where the group will not be disrupted by visitors and that abounds with relatively various types of sounds, natural and manmade.

Materials: clipboards, paper, colored pencils, eyepatches (optional).

Procedure & Activities:

1. Beginning/Warming-up
   1. Begin with everyone standing in a circle. Go first with yourself and make a special sound. Any sound is acceptable as long as everyone else in the group are able to copy it.
   2. Everyone copy the sound, one at a time, in a clockwise direction, as quickly as possible. End with the beginner who repeats the sound once.
   3. Then start with the person who stands left to you and makes his/her own specific sound. Continue the process until you have gone all the way around the circle.

2. Playing with the sounds
   1. Walk into the center of the circle and ask participants to keep a distance from each other in the circle. Adjust the circle to make sure everyone can hear clearly what you will say.
   2. Distribute the materials to the participants. Each gets a clipboard, two pieces of white paper, and a set of colored pencils. Invite participants to choose a colored pencil, the color of which represents his/her impression of the community or the current mood.
   3. Participants turn around, facing out and find a comfortable way to sit down. They position a piece of paper in front of themselves which represents the physical layout of the area. They keep the pencil point on the paper, close their eyes, and start to listen to the various sounds around them. They should keep eyes closed throughout the activity and not lift the pencil off the paper.
   4. Let’s say they hear some leaves rustling overhead and birds singing upwards. They draw a line on the paper connecting the symbolic positions of the voices of the leaves and those of the birds. That is, they trace the sounds they hear with one continues line around the paper as they hear them. They allow their hand and pencil to dance with the sounds.
   5. Whey they feel done, open the eyes and look at the sound map. Feel free to embellish this drawing by adding colors, shapes, and/or words to it if they are inspired. Give the sound map a title.

References:

III. Sharing Experiences
1. Split randomly into groups of 5-6 participants. They choose a site in the park where feel safe, comfortable, and welcome.
2. A person in the group begins to express the experiences before, during, and after the drawings. He/she can describe what he/she heard just now, what he/she drew in the sound map, what his/her first impression is when looking at the sound map, and what thoughts and feelings the sound map triggers.
3. Other group members respond to the person by empathy listening, listening carefully and uncritically. Take turns until everyone has an opportunity to express.
Environmental Art

by Linda Charlton and Allison Russell
San Antonio, TX

**Goal:** By the end of the assignment students will have an understanding of what Environmental Art is and how to interpret and translate a message through a specific medium. They will also be able to make observations about the natural world in order to understand and interpret it. Finally, they will learn how to work together to create a collaborative artwork.

**Age:** 5-12 years old

**Directions:** Take students to various ecosystems. Spend time journaling or sketching how the landscape makes them feel, what they hear, and what they see. You may take tools like cameras, magnifying glasses, tweezers, bug jars etc. to help with the investigation of the landscape. Research environmental artists and their intentions in art making. When you arrive back to the classroom have students write down and discuss ways they can interpret what they saw/heard/smelled. What is the message they want to send? How do they want to explain the benefits of it? Discuss which medium would translate the message best to the public and work together to create a collaborative piece of art.

**Background:** It’s hard to pinpoint when exactly Environmental Art began, but it has definitely played a major role in the art world within the past few decades. The first humans were the earliest environmental artists. Think about Stonehenge or the Nazca Lines. Those are examples of the first humans interpreting their world and responding. Artists from around the world have created all kinds of art from sculpture to photographs to performances with the intent of communicating something about their relationship with nature. There are many significant artists to reference as inspiration for the class piece.

**Resources:**

http://greenmuseum.org/content/generic_content/ct_id-198.html
http://christojeanneclaude.net/projects/the-gates
http://diaart.org/visit/visit/walter-de-maria-the-new-york-earth-room-new-york-united-states
http://www.stickart.net
http://www.goldsworthy.cc.gla.ac.uk

**Standards:** NA-VA.K-4.1 / NA-VA.K-4.2 / NA-VA. K-4.3 / NA-VA.K-4.5
NAAEE Standards: Strand 1-Guideline B; Strand 2.4-Guideline B; Strand 3.1-Guideline D

*This project is developed for the Urban Environmental Education course, Cornell University Civic Ecology Lab, April - June 2017*
Approaching the Mangrove

◆ Background

With the development of urbanization, mangrove wetland ecosystem has been crashed by people. Shenzhen Mangrove Forest Nature Reserve is the only nature reserve which located in the city hinterland in China. That means, on the one hand, it faces more challenges including water, light, air, noise pollution, the outer land ecology destroyed and the influence of city dwellers. It’s necessary to strengthen the public’s awareness of knowing and protecting the mangrove. On the other hand, located in the city hinterland also means that the periphery of the nature reserve can be the inartificial city classroom.

◆ Notice

1. Obey the management of the reserve managers. Keep quiet.
2. Waring light color clothes (yellow and green was suggested in order not to frighten the birds), sneaker. Spraying repellent moderately.

◆ Course list

- Shenzhen Fushan Mangrove Beach Ecological Park
- Shenzhen Mangrove Forest Nature Reserve
- Shenzhen Bay Nature Education Center
- Gather, Warm up, Self-introduction
- Interpretation, Interaction, Observation
- Discussion Section
- Natural Creation
- Sharing and Enlightenment
- Think and Act

Activity

Preliminary:
- Information collection: Participants register online and fill in their individual information
- Place applications: Shenzhen Mangrove Forest Nature Reserve (trial plot), Shenzhen Bay Nature Education Center
- Material:
  - Water, plaster, bowl, spoon, hardboard
  - Pictures of mangrove, notebooks, pencils, camera, first-aid packet

Process:

1. Gather, Warm up, Self-introduction: Each participant can give itself a natural name to build the connection with nature.
2. Interpretation, Interaction and observation: The interpreter will introduce the basic knowledge about the mangrove such as what’s mangrove, what’s the mangrove besides the plank road in the nature reserve. The participants should observe the mangrove including the leaves, flowers, roots, stems, fruit, seeds and collect the fallen leaves under the guide of interpreters.
3. Discussion Section: Participants can understand the characteristics of mangrove and their environmental adaptation by discussed the question: If I was a mangrove, how can I survive?
4. Natural Creation: Participants can make the leaves they collected into a plaster model in person.
5. Sharing and enlightenment: Participants can sharing their discoveries about the ecological value of the mangrove and illustrate one thing it can do for protecting the mangrove each one.
6. Think and act: Finish the activity summary and the nature notes (text, drawing or image etc.).

◆ Reference

1. 《Flow learning TM》 Joseph Cornell
2. 《认知红树林》广东内伶仃福田国家级自然保护区管理局，深圳市红树林湿地保护基金会，2016. 06.
Activity Plan

HOW HEALTHY ARE OUR URBAN RIVERS?

Elize Loubser, Wild Serve, Pretoria, South Africa
This project is developed for the Urban Environmental Education course, Cornell University Civic Ecology Lab, April – June 2017

Goals:
- To educate both adults and children about the health of urban rivers in Johannesburg and Pretoria (in city and nature reserves) and the journey of water
- To educate them on methods to measure the health of rivers and how they can contribute to measuring this
- To raise awareness around water scarcity and how we must appreciate this vital source of life. To raise awareness of the role we play in polluting as well as protecting this source.

Materials:
- miniSASS score sheet
- Notebook
- Pen / Pencil
- Sieve / net
- White Tray / Ice cream container
- Gum boots
- Life-jacket
- GPS
- Towel
- Plastic bags
- Gloves

Activities:

Phase 1: Getting to know the urban rivers and wetlands (adopt a river)
- Arrange a field trip to the inner-city rivers as well as Rietvlei Nature Reserve’s rivers and streams
- Map the location of the rivers and wetlands and note its origin as well as destination
- Note level of and types of pollution in and around the river/stream
- Identify wildlife species that may use these rivers
- Identify possible sources of pollution in close proximity to the rivers
- Clean rivers and riverbanks

Phase 2: Testing the water quality of the rivers
- Use miniSASS sheet (Stream Assessment Scoring system) as a tool to monitor the health of the river/s
- Collect samples in water and underneath rocks and in sediment and identify all microinvertebrates present
- Fill in data sheet with sensitivity scores
- Identify invasive plant species that may influence water quality (for future projects)

Phase 3: All participants to upload water health results to miniSASS website (www.minisass.org)
Phase 4: Identify and implement possible action measures to be taken to improve the state of the studied rivers on a long-term basis.

For further information & educational resources:
www.miniSASS.org
The Sense Of Place Experience In Zhouzhuang

Dan Liu, Beijing University of Chemical Technology, Beijing, China
This project is developed for the Urban Environmental Education course, Cornell University Civic Ecology Lab, April-June 2017

Activity Target: Make the participants strengthen their understanding of sense of place, and then provide suggestions for the construction of environment-friendly city scenic spots.

Number of participants: 10-20 people

Age requirements: 18-70 years old

Activity Venue: Zhouzhuang, Kunshan City, Jiangsu Province, China

Activity design:
1. Participants arrive at designated place to know the activities and the culture of Zhouzhuang in history. Then they required to carry out a street interview, the content includes: (1)Have you ever gone to or heard of Zhouzhuang? (2) Answer "yes" → Please share your impression of Zhouzhuang to us; Answer "no" → If you can travel to Zhouzhuang, do you have anything to expect? (3)If a place is going to develop its urban tourism bases on the original natural environment, could you please give us some suggestions?
2. Visit Zhouzhuang and then give at least 5 words to describe it.
3. Live in a local family to study how to making food and crafts and take an interview of local people: (1)The degree of happiness about living in ZhouZhuang; (2)What do you like about Zhouzhuang? Or what would you expect Zhouzhuang to improve?
4. Do a research for the model that ZhouZhuang has taken of its development, and then analysis the link between its natural landscape, built landscape and cultural landscape, of course, share with all people who participates in this activity.
5. Provide 1-3 recommendations for the construction of environment-friendly city scenic spots by combining with our own feelings and the views from the locals and outsiders.
6. Invite visitors and locals to paint some things they like here and make bookmarks to strengthen the sense of place in ZhouZhuang.
EDUCATING LOCAL ACTORS ABOUT GREEN INFRASTRUCTURES

David Alba

transitando
ecología y educación para una ciudad sostenible

Madrid, Spain.

"This project is developed for the Urban Environmental Education course, Cornell University Civic Ecology Lab, April-June 2017"

Recently, Madrid Town Hall is developing a process of “renaturalization” of their river, Manzanares, in the framework of the Local Strategy for Climate Change Adaptation. This kind of nature-based solutions implies different technical actions but also educational activities.

**Audience:** local actors (technicians and policy-makers) and citizen in general.

**Goal:** Transferring ecological approaches in urban planning to policy-makers, technicians, urban professionals and students.

**Activities:** We will design and develop a distance training course about assessment and implementation of urban green infrastructure. We are planning a non-formal activity that will include two special steps to develop this training course:

a) Preparing and document with a conceptual and methodological framework to assess the impact of previous and future planning on urban ecosystem services. Students will access to our web platform to read and discuss the document, including the selection of what kind of information will be collected to assess the renaturalization of Manzanares River. We will separate students in groups, in relation to the different ecosystem services to be examined: provision, regulation and cultural services. Each group will define some indicators for each area, taking into account that these indicators will reflect the situation of the river before and after the renaturalization process.

b) Visit to the river to collect information about the evolution of the river because of the renaturalization process, like new vegetation areas in the river, birds and other present species…

c) Exhibition of the results of the evaluation to the local community, for example, in an exposition in the Town Hall.

d) Evaluation.

Additional resources (in Spanish):

[Video “Madrid + Natural”](#)

[Programa “Madrid + Natural”](#)
City Campus, Green Campus: A Tree Exploration

Erica S. Tietjen, University of Nevada, Las Vegas
Project developed for the Urban EE Course, Cornell University Civic Ecology Lab, April-June 2017

Ages: College undergraduates

Learning Objectives – Students Will:
--Observe, explore and explain the value of trees on their university campus, using simple to minimal equipment
--Gain a sense of appreciation and ownership for their urban campus green spaces

Time: 3-4 class periods (75 min.), additional time out of the classroom as necessary

Materials: --observation notebook and pen
--measuring tape
--smartphone, with spirit level app (e.g. iHandy Level for iPhone)

Activities:
Mapping and Sampling Plan: (60 minutes)
--Students will use a Google Earth map to survey campus and determine the locations of tree enriched campus locations, and devise a sampling plan of sites based on their chosen plot size and location.
--Students will use the USDA Forest Service i-Tree site (http://www.itreetools.org/) to estimate tree canopy coverage for all trees in the chosen sample site.

Observations and Natural History: (30 minutes)
--Students will spend time making qualitative observations (narrative/descriptive, sketches) of trees in their sample site and describe:
--General architecture of the trees, including color(s), stature, presence of flowers/reproductive structures, aesthetic qualities, canopy features/shade provision
--Wildlife presence and animal interactions
--Human presence and interactions

Tree Identification and Inventory: (2 hours)
--For each tree in their sample site, students will:
--Identify tree by species and common name
--Determine DBH (diameter at breast height) using the measuring tape (diameter = circumference/pi)
--Determine height using the spirit level app and calculate by visiting: https://gabrielhemery.com/2011/05/15/how-to-calculate-tree-height-using-a-smartphone/

Tree Environmental/Economic Value and Benefits: (60 minutes)
--Students will use the Tree Benefit Calculator (http://www.treebenefits.com/calculator/index.cfm) to determine CO₂ sequestration, air quality improvements, stormwater management, and other functional benefits

Extensions:
--Develop a campus tree and vegetation guide with photos that can be used by other classes
--Monitor ecosystem features (temperature, soil quality, etc.) at each plot for long-term data collection and reporting
Objective

- Training young adults who want to become knowledgeable ambassadors for bird-watching and bird conservation.
- Create an interactive environment for learning bird watching and cultivate urban environmental education stewardship.

BIRD-WATCHING EXPERIENCES AT THE URBAN PARK

- Indoor training: bird watching and common birds in the urban park.
- Select an urban park nearby to begin bird watching.
- Encourage students to make observation record of the bird watching experiences (photos, drawing or field notes).

SELECT A BIRD TO OBSERVE AND LEARN

- Divide students into groups.
- Choose one species which can be observed at the park and make a study plan of it.
- Work in groups to write an article about the selected bird.
- Share the group finding of bird-watching and the selected bird species via social media (blog, Wechat, Weibo, facebook, etc).

INTRODUCE BIRD-WATCHING TO OTHERS

- Work as volunteers to introduce bird-watching to public.
- Design booths (with posters, photos, or games) to introduce the selected bird.
- Debriefing and sharing experience afterwards.

Teaching and learning materials
- Binoculars
- Telescope
- Local bird guide book

Time required
- 4-6 weeks
- 3 hours per week

Venue
- Urban park or wetland or nature reserve

Target group
- College students ~ 20 people

Keywords
- Adult education;
- Urban digital storytelling;
- Bird-watching

Reference
- Education for Birdlife

This project is developed for the Urban Environmental Education course, Cornell University Civic Ecology Lab, April-June 2017
ENGAGING ON ENVIRONMENTAL TRANSFORMATION OF CITIES
AND HELP EACH OTHER GROW

AUDIENCE: ALL AGES

GOALS:

- To reflect and dialogue about the impact of urbanization on the ecosystems and how cities can be developed in a much more socially just and sustainable way.
- Use these reflections to design a communal urban garden within the museum with the objective of triggering a process in the participant’s barrios, leaded by them.

Background:

This is a Non-Formal Education Activity thought to be practiced within the installations of a Children’s Museum as a permanent and come back activity for visitors and people interested on participating on a communal urban agriculture project. The main public is families which implicate the use of intergenerational strategies and educational approaches.

The strategy in this project would be to use the principles of Critical Pedagogy and Participatory Action Research to discuss how participants perceive cities and how cities can be either an opportunity to perceive the complexity of environmental problems and engage in local innovations to take action and address those problems; or they could mean a growing menace of degradation and destruction of other types of ecosystems.

Cities are rich in cultural diversity and thus, diversity of ideas and understandings of the world. It is through dialogue that one may reach a significant reflection that may be translated into actions.

With this activity, we would seek to engage the museum visitors in participating in an urban agriculture initiative set in a little reserve next to the facilities of the Museum. The intention is that the participants take ownership of the place and project to start a community learning process to create an urban garden with the possibility to reproduce this same process in their local barrios.

Big picture steps:

- Start a Dialogue using local pictures of the city to talk about the contrasts of the urban characteristics and the “natural” parts of the city. Pictures of past/present changes of the city may also be used. The objective is to trigger a dialogue about the city growth and the transformation possibilities of this particular ecosystem aiming to a more equitable and sustainable relationship with our environment.
- A communal mapping activity can also be done, where participants organize to draw a map of the city and the places they consider most important, the places they consider natural areas, the places they perceive as environmentally threatened and the places where they live.
- Next big step is to help organize and design the work plan to initiate the urban community garden with everyone’s participation. The whole process means a learning and transformation experience which has to be documented (field diary, pictures and interviews) in order to identify the advancement and challenges.
ECO Friendly Life With Living Water Garden

Fei Yang (Also called Yafu Yang), YFED
Chengdu, Sichuan, China

This project is developed for the Urban Environmental Education course, Cornell University Civic Ecology Lab, April-June 2017

Age: 6 yrs old and up

Time: 2 hrs

Goal:
Let the children and their parents to learn eco-friendly life together, and learn to protect the urban community environment.

Activity:
Organization: 10 people
Volunteers: 5 people
Participants: 20 families (3 people/per family X 20 = 60 people)
Registration method: School lottery

Materials:
Printed questions.
White paper and color markers.
Bottled water.
Cellphone.

References:
Eco-friendly life

Living Water Garden of Chengdu, China

Background:
Eco Friendly City Elements

Sunday
9:00 AM, Event organizers and volunteers meet at the entrance.
10:00 AM, Participant meet in the amphitheater.
10:00-10:05 AM, Activity description.
10:05-10:20 AM, Grouping. Each group has five families, total four groups, 15 people each group, each group elected a team leader. Then each group received a questionnaire and the task.
(Note: Everyone is an individual, when the individual group formed a small community, four groups formed a small society.)

Questions:
1. What is eco-friendly life?
3. Why do we need to build a Living Water Garden?
4. How does the Living Water Garden purify the water?
5. Please find at least five elements can be used to purify water in the Living Water Garden?
6. Please find at least five aquatic plants in the Living Water Garden?
7. Please find at least three kinds of garbage and its classification packaging in the Living Water Garden?
8. Which of the attractions is your favorite in the Living Water Garden?
9. How to achieve eco-friendly life and protect the ecological environment after you back home?
10. Find a visitor, explain the Living Water Garden to the tourists, to achieve eco-friendly life, and protect the ecological environment (please use the cellphone to record 3 minutes video and upload to wechat group)
10:30 AM, Event starts.
11:45 PM, Collect the questionnaire and upload the video.
12:00 PM, Issued a certificate and presented eco farm gifts.
12:30 PM, End of event.
Make your own GREEN COMMUNITY

“This project is developed for the Urban Environmental Education course, Cornell University Civic Ecology Lab, April-June 2017”

Hye Seon Kwon (Dandae elementary school, KOREA)
Saerom Ahn (Seoul National University, KOREA)
JY Kang (Seoul National University, KOREA)

All pictures come from “Seoul citizens’ discussion for the issue of fine dust (2017.05.27)”
(http://www.coe.go.kr/sps/jsp/boardDetailAction.jsp?seq=1915424)

ISSUE : Providing Green Infrastructures (Seoul city, KOREA)
Subject : Residents living in Seoul (7person * 30teams)
Place : Seoul square
Material : Round table, Communicating System, Keynote material, Well-trained facilitators
Purpose : 1) Improving residents’ interest of Green Environment with a participatory discussion
2) Improving community engagement with a participatory discussion
3) Suggesting Green Infrastructure ideas to the Seoul civil government with a participatory discussion
Age : All ages!
Precautions : - PR to all ages residents
- Preparing Well-trained Facilitators (Environmental Educators)
- Encouraging public government to participate in this forum

Activities

Step 01. What GREEN INFRASTRUCTURE do we need?
(Lectures, 60min)
1. GREEN INFRASTRUCTURES
   - What is the GREEN INFRASTRUCTURES?
2. Decision making related with Policy
   - What is the policy?
   - What should we consider when make a policy idea?
3. Community engagement in Sustainable Development
   - What meanings do this forum have?

Step 02. Round Table Discussion
(60min)
1. What infrastructures should we make?
2. Where & How do we make it?
3. Why do we need to make it?

Step 03. Peer Feedback
(20min)
- What effects will it occur to the community?

Step 04. Summarize the Discussion and
Submit the Policy Suggestion
(20min)

Step 05. Selecting Suggestions with Voting
(After discussions)
RESTORING WATERFOWL MIGRATION HABITAT

Jennifer Young
Thacher Nature Center, Albany, USA

ACTIVITY

IN THE CLASSROOM

- 20 minute PowerPoint presentation describing waterfowl migration and the importance of stop over locations.
- What the birds need to make it to their breeding grounds.
- 10 minute game where some children wear a duck headband and others wear a leaf headband.
- Have the kids put on their headbands.
- Start with a few plants and a few ducks. Each duck can eat one plant. Have more ducks than plants at first.
- Then add in a few more plants (say these are the plants the kids will be growing); show that the ducks now have enough food to continue migrating.
- Add different examples for the kids to act out.
- Have as many rounds as time allows.
- 20-30 minutes (depending on class size) for planting the seeds and setting up the grow light.

EDUCATIONAL BENEFITS

- Children get a sense of place.
- Allows them to experience the different habitats in their own backyard.
- Provides an opportunity to make a positive difference in the environment.
- Learning their ecological identity—realizing their own responsibility for sustainability and a healthy ecosystem.

AT THE SITE

- Short nature walk around the site showing the children the existing ecosystem and examples of biodiversity. Teach about the area so they get a sense of how their plants fit into the ecosystem. Show that their hard work is going to benefit many creatures that live in the area, not just the waterfowl.
- Plant the seedlings.

MATERIALS

- Grow light
- Timer for grow light
- Rack to hold light over the tray
- Spray bottle for watering.
- Plug tray for seeds
- Seeds
- Soil
- Paper headbands

Learning Goals:

- Learn the migration of different bird species in the area.
- Why a healthy habitat is important.
- Learning about the food web and the connectivity in an ecosystem.

Age: 8 years and older

Time Requirements:

- In-classroom: 50-60 minutes
- Taking care of plants in class
- On Site: 1.5–2 hours

Suggestions/Tips:

- Check in with teachers every other week to monitor the growth of the plants.
- Change the species of plants every year and create a mini-ecosystem planted by the school.

This project is developed for the Urban Environmental Education course, Cornell University Civic Ecology Lab, April-June 2017.
Goal: Participants will learn about environmental art and connect with nature while creating their own ephemeral sculptures.

Audience: All ages, connects to visual art curriculum.

Timeline: 2 hours, divided into 3 main parts.

Description:
Participants learn about artists such as Andy Goldsworthy, Patrick Dougherty, Martin Hill or Robert Smithson. These artists use primarily natural materials to create site specific art. Following a slideshow showcasing examples of environmental sculptures, students will create their own piece in nature either individually or in a group. The program culminates with a curated gallery visit to each student created are piece and photographing the art to cherish these beautiful ephemeral art forms.

Preparation: Environmental Sculpting slide show with inspirational photos from the internet. Images can be hard copy, but large projection from computer is very impactful.

Materials: slideshow and projector or printed photos, reusable vinyl shopping bags for collecting materials (one per person or per group).
CREATE YOUR
CITY LUDO

MAI JIAXIN,  GUANGZHOU UNIVERSITY OF CHINESE MEDICINE

GOAL:
- To build city residents’ connection with the society and nature;
- With the help of art education and multimedia tool to create and strengthen a sense of place in the city;
- To provide teenagers a wider and complete perspective and view of the city they living;
- To learn and deepen understanding the city by playing interesting game and sharing stories with each other.

Participants: aged 12 or above
Number of participants: 4 persons for a group, 2 teenagers and 2 adults (which can be their parents or relatives)
Time: 80 min

Preparation: teenagers should draw their own city LUDO MAP by hand or with other kinds of tool, such as PS, FLASH in advance based on their daily and specific observation.
Playing: based on the rule of Ludo, rolling the dice to decide how many steps players can walk and next according to which place the players stop, he or she should tell other participants the basic information about this building, such as whether it open to the public or is it a old building or new one. What’s more, player can also be a storyteller to share his or her story with this place.
Explorations of Campus Plant Communities

Jingwen Shi, Beijing Forestry University

Age: High School; Time Length: 4 hours

Learning Goals:
- To strengthen students' understanding of ecological habits knowledge.
- To help students understand the impacts on plants due to ecological conditions in artificial phytocoenosis (plant community) dissatisfying ecological habits requests.
- To broaden students' understanding of plant arrangement principles and methods (ecologically and aesthetically) in artificial phytocoenoses.
- To work on theory application, research, collaboration and presentation skills.

Activities:
1. Select 3-4 typical artificial phytocoenoses (plant communities) in campus.
2. Introduce the selected plant communities respectively.
   - Introduction points:
     - The ecological habits of the plants in this artificial phytocoenosis.
     - General present conditions (abundance, density and coverage), whether those conditions meet the requests of the plants’ habits and then the impacts of not meeting the requests.
     - How the phytocoenosis is designed ecologically and aesthetically – plant arrangement principles and methods.
3. Divide the students into groups of 4-5 members.
4. Research on one artificial phytocoenosis selected by the group and present the research results – the ecological habits and present conditions of the involving plants, the ecological habits theory applied in the selected artificial phytocoenosis and the aesthetic methods applied in the selected plant arrangement.

Reference: http://yuanlin.bjfu.edu.cn/
http://www.plantphoto.cn/
Learning Goals:

- To feel, enjoy and discover urban nature
- To cultivate ability to comprehensively judge nature
- To nurture ecological place meaning
- To disseminate learning outcome to others

Intended Audience: 3rd graders and up, maximum 20 people
Duration: 3 days and presentation day (Exhibition etc.)
Venue: school and green spaces (e.g.: parks)

To implement this program, it is recommended that you work with the following persons.
1. A Person who knows well about plants and animals in your target local place
2. A Person who can tell charms of creatures and express them into pictures and sketches etc.
3. Local people, who knows well about green spaces or greening activities in the target place
4. Creators, who can help expressing children's ideas into various environmental art form

Day 1  Learning how to enjoy nature and creatures in the local place

1. Introduce interesting creatures’ charms and their life with photos, videos, books etc.
2. Introduce how to observe plants and animals and tell how to sketch them.
3. Show some local plants and animals to children and let them choose a favorite one for sketching.
4. Let children sketch the selected plant or animal.
5. Share and talk about their works.

*Time: 1.5 hours
*Materials: pencils, colored pencils, papers, magnifying lens, local plants and animals for sketching

Day 2  Making species map in the local place

1. Divide children into 5 groups.
2. Tell how to observe and take plants and animals pictures.
3. Explain how to make a creatures map and some rules for walking outside.
4. Walk around the local place, take creatures’ photos, mark the discovery point and write discovered creatures’ name and characters.
5. After sharing their maps with one another, write their findings on a big sized map with pictures and drawing etc.
6. Present their maps to other groups and share positive feedbacks with children.

*Time: one day (9:30-15:00, including lunch break)
*Materials: pencils, clipboards, five digital cameras, printers for printing the photos, computer, maps of the local area, visual dictionaries of animals/plants

Day 3  Experiencing and learning local greening activities

1. Give a local map to children and explain about places where children will visit.
2. Visit some local greening activity places and explain about the activity.
3. Make a note about the activity and take pictures of the activity places.
4. Experience planting local species at the greening places.
5. Talk about their findings and share what they have learned from 3 days program.
6. Introduce ideas and ways for presenting their findings to local people. (e.g.: painting, sketching, craftwork, making report etc.)

*Time: one day (9:30-15:00, including lunch break)
*Materials: pencils, colored pencils, clipboards, five digital cameras, computer, maps of the local area, visual dictionaries of animals/plants, watercolors etc.

Day 4  Presenting their outcome at local community event

1. According the feedbacks, let children improve their works. Ways of the presentation depends on children’s preferences.
2. Give a certificate of this program to the participated children.

*Time: 2 hours
*Community event should be planned and prepared before the whole program starts.
*Works from day 1 and 2 can be exhibited too.
Objective
By classification of objects, students will identify different categories of garbage found in trash. The inquiry-based learning will help students to cultivate skills of comparing, and classifying in fostering an awareness and knowledge of solid waste to build sustainable school.

Age and Time
Age: 7-10
Time: 45 minutes

Materials and Getting Started

Materials
Trash items (cleaned); several empty cardboard boxes labeled with different categories (Metal, Paper, Plastic, Glass, rubber, textiles, organic waste, hazardous waste, etc.); colorful labels.

Getting Started
Ask students to think about the composition of different items in trash around the city. Name various categories of materials (paper, plastic, mental, etc.) and an example of each.

Procedure
1. Line up boxes on the front desk, with one per category. Each box should have a label—metal, plastic, paper, glass, rubber, textiles, organic food, etc. and sample or illustration. Then give the class a brief explanation of each category and show them an example.
2. Divide students into groups and give each group a set of trash items that at least one example from each materials category, and a set of labels. Have students sort and label the objectives by material type.
3. When students have finished classifying their objects, ask each group to deposit them in correct cardboard box in the front of the room. List the trash items by category on the board.
4. Set up a garbage detective in the classroom. Give each student or group of students a category of material and tell them that within a certain time limit they have to find an object in the room that is made from that material and must label it by material type.
5. Extension: Divide the class into teams, each representing a different category of material. Each team develop a list of everyday items made from their material. For example, the plastic team might include toys, hairbrush, etc. They keep a daily note of they use made out of their material. A week later, the class compare lists between teams and discuss how important each of these categories of materials is to our life.
Create a sense of place with the school roof garden

Lipeng Wu, X095839, Shenzhen moisturizing Ecological Technology Co., Ltd, Shenzhen, China

Course Basics: The course is based on the "four seasons working" environmental education science base, It changed the useless roof garden to a small roof ecosystem which contain vegetable, flower, fruit, Chinese Herbs, science exhibition center by unified planning, unified guidance, unified supervision. At the same time we design lessons in accordance with 24 solar terms for different classes and implement environmental education.

Background: Many urban youth spend less time in nature. There are many reasons, such as kids don’t know how to play, what to paly, where they can play and parents mistakenly think that play will affect the child’s academic performance. This program will solve the child’s natural deficiency problems, improve children's overall quality, improve the child's academic performance. This lesson is for one of the full courses.

Learning Goals:
1. By teaching children to play outside, establish the relationship between children and nature.
2. Use the school roof garden to create a sense of place
3. Strengthen the child's ability to describe, and indirectly improve the child's academic performance.
4. Develop children's hands-on ability and teamwork ability.

Age: 7-11 years
Time: 50 minutes
Materials:
Drawing board, drawing paper, glue, brush, soil samples, vegetable seedlings, planting shovel, watering pot.

Activities:
• **Guidance (8 minutes):** the teacher introduced the four seasons and solar terms, guide children to feel the solar terms and to describe the feature of it, lead the child's mood into nature.
• **Observation (20 minutes):**
  1. Split the children into groups of 4-5 each, everyone will get a painting tool, each group get a large backboard, let the children go to the garden to find a friend and draw down, and they should describe their friend by any form , the friend can be plants, animals or small object that in the garden.
  2. Each group should post their own friends on the big backboard and then discuss how to connect their friends. Finally introduce their works to other groups of children.
• **inquiry (10 minutes):** the soil is the basis for the survival of garden plants, children should find the difference between different soils, then teacher introduce the relative knowledge to the children. Finally let the children choose suitable soil for their friends.
• **practice (12 minutes):** Teach children to know the common vegetable seedlings and teach them how to plant. Leaving after school operations, observe and conserve the vegetable constantly.

This project is developed for the Urban Environmental Education course, Cornell University Civic Ecology Lab, April-June 2017
Trash in Our Waterways

Maria Martello
New York Botanical Garden, Bronx, New York

This project is developed for the Urban Environmental Education course, Cornell University Civic Ecology Lab, April-June 2017

**Objective:**
Target age: 7th and 8th Grade

**Pre-Activity** Tour of the Bronx River and Adjoining Forest touching on the following points:

- The source and exit point of the Bronx River
- Trash booms
- Pros and cons of man-made waterfalls
- Point out floodplains, eroding banks, invasive plant species
- Discuss effluent, runoff, combined sewer overflow
- Human impacts to riparian ecosystems
- What problems are specific to urban rivers and waterways

**Activity:**
Have students sort pre-collected trash using rubber gloves and trash pickers and tally using the following worksheet (trash should be pre-checked for biohazards such as syringes and condoms)

http://bronxriver.org/puma/images/usersubmitted/file/Eco/QAPP/AppendixC.pdf

**Discussion questions:**

- What wildlife did you see on the river during your tour?
- What man-made objects did you see?
- Where did they come from? Were they tossed in the river at this location? Or carried here by the water?
- Where did you see trash accumulating? On the banks? Around fallen tree stumps?
- What type of trash was most common?
- Did you see any brands you recognized among the trash?

References:

http://www.bronxriver.org/
Urban Eco Tour through the City
Megan van der Haar, WildServe, Johannesburg, South Africa

This project is developed for the Urban Environmental Education course, Cornell University Civic Ecology Lab, April-June 2017

Goal:
- Develop students’ sense of place
- Students will gain an appreciation for green infrastructure in their local environment
- Develop participants academic and social skills, such as public sharing, active learning and community stewardship.
- Learn about techniques that reduce impermeable surfaces and enhance green spaces in the city

Activity:

1. The educator prepares a range of destinations within the local community that displays green spaces. Some of these may include but are not limited to:
   - Green wall in the city or alternatively green infrastructure in public spaces (shopping centers, in the streets or at a local school or university)
   - A river where a section has been rehabilitated or two rivers where one is natural and the other is lined with concrete
   - Green roof
   - Local park
   - Polluted area

2. The group of students (between 10-15) choose the destinations that they want to go to by manner of voting.

3. The students visit the chosen destinations.

   For a visit to a green wall or green infrastructure in a public space, the educator explains why it is important to incorporate green spaces into the city. Sample questions that the educator can ask the group is: What other types of green infrastructure are you familiar with?

   For a visit to the rivers or a river where a section has been rehabilitated, the students write down and compare, in two columns, the natural or rehabilitated part of the river to the part that is lined with concrete. The educator helps by using prompt questions: In which river do you see more wild life and plants and why do you think that is so?

   For a visit to a green roof, the educator explains how green roofs can be used to reduce the negative impact of hard and impermeable surfaces in the city. The educator also explains how such incentives can be used for poverty alleviation by planting vegetables on green roofs. The students are given pocket habitats. They fill the pocket habitats with soil, plant a vegetable of their choice and water the plant.

   For a visit to a polluted area such as a polluted river, neighborhood or city street, the students compare the space to the equivalent non-polluted area (as for the river visit). This can be accompanied with the river visit. Sample questions that the educator can ask are: Where do you think the pollution goes to? How do you think it affects animals? What would you do to solve the problem?

   The tour should ideally end with a visit to a local park. The students have a picnic and each student shares their favorite part of the day and what they found most valuable.

Intended audience: Grades 5-7

Duration: 1 Full day

Educational approaches: Nonformal environmental education

Required materials: clipboards, paper, pencils, pocket habitats, soil, water, selection of seeds

Additional Resources:

How Effective are Storm Drains?

Overview:
Urban storm drains are designed to channel excess rainwater into nearby waterways to prevent localized flooding. One impact of climate change is an increase to the severity and frequency of local rainstorms. During a rainstorm, stormwater washes waste and other types of pollution (e.g., oil, cigarette butts) that are left on the streets, parking lots, sidewalks and other hard surfaces into the drains. Although many storm drains are grated to prevent large objects or debris from falling through, waste can sometimes be swept through the gratings and discharged into local waterways. Can storm drains better designed to prevent trash from entering local waterways?

Storm Drain Design

Description of Activity
Participants: Grades 4-8, elementary students
Time outside: 40 min. Total time: 220 min.
Environmental Focus: urban water systems, cause and consequence, stewardship
Preparations
• Materials to create and test model of storm drain
• Materials to create stencil
Resources
• Images of storm drains
• Shoreline cleanup data
Minds-On:
Explore your community storm drains with a walking tour of the neighborhood around the school.
Document the grate design and any trash in and around the storm drain. If possible, locate a storm sewer outlet in your area. Document any trash or garbage in and around the storm sewer outlet.

Action:
Review the 10 most common trash items found in your area’s Shore Cleanup and compare to trash found in your community.
Design and test a storm grate model that would prevent common trash items from entering the stormwater sewers.

Consolidate/Connect:
Design a stencil to be painted adjacent to storm drains to inform your community that anything that enters storm drains ends up in local water systems.
Invite a speaker from the city’s water department to speak to stormwater issues and solutions.

Sources
1 http://www.healthylakehuron.ca/news_item.php?NewsID=140#sthash.fyCYAeH2.dpuf
3 Photos courtesy of Ocean Conservancy and NOAA

This project is developed for the Urban Environmental Education course, Cornell University Civic Ecology Lab, April-June 2017.
**Rewarding Green**
Panwen Fang, Nanjing Forestry University, Nanjing,

**Audience:** Community members

**Age:** all ages

**Goals:** To promote awareness of low carbon and green life in urban. To build a sense of responsibility of environment. To understand the significance of travel green. This project is developed for the Urban Environmental Education course, Cornell University Civic Ecology Lab, April-June 2017.

**Time:** 2 hours

**Materials:** Plantings
Posters
Step calculation

**Activity:**
(1) **Introduction (10-20 mins)**
Introduce *green travel* concept, including walking, biking, bus, subway, and many other low-carbon transportation. Introduce in our activity, walking is the main green travel type. Introduce how to get rewards from walking.

(2) **Green Travel Time (1-1.5 hours)**
We encourage community members to walk during the green travel time. When starting walking, members are required to wear the step calculation on their hand, which are able to count how many hours and how many steps they take. Members can walk to anywhere during the activity time but have to come back at a fixed time.

(3) **Reward Green Travel (10 mins)**
After 1-1.5 hours walking, all members’ step calculation will be collected to calculate their steps and hours. Based on their performance, 0.5 hours can be rewarded one plant, 1 hours walking can be rewarded two plants, 1.5 hours three plants. Through this way, we encourage community members travel green, which is positive to our environment.
Green Space of Everyone: A Role-playing Game

Author: Sizhe Xie, Department of Sociology and Social Work, Sun Yet-sen University, Guangzhou, China

This project is developed for the Urban Environmental Education course, Cornell University Civic Ecology Lab, April-June 2016

Goals: Students learn the environmental justice issue through a survey in an urban green space and make a group decision through a role-playing game.

Age: high school students or adults
Number: 8-15
Time: One day (8 hrs)

Note: If time is limited, sections could be shortened or certain sections could be eliminated. For example, you could cut out the interviewing section and let students do the role-playing game after observing.

Background:
Green spaces in a city are not equally accessible to everyone. The disparities are related to social factors like social class, race, ethnicity, ability and so on. And the needs and desires of groups at a disadvantage are usually neglected in the urban planing.
This plan guides students to find out this phenomenon by doing surveys, and explore a more equal way to make decisions on a public green space.

Materials:
Printed record forms and interview questionnaires; paper, notebooks, cell phones, camera or other electronic devices to take notes or photos

Suggestion:
The plan could be repeated in different locations to explore the environmental justice issue on the scales of region, cities and even countries.

Activities:
- **Step 1 – Observing and recording (1 h)**
  Students arrive the chosen green space, observe and record the natural and social environment, including the infrastructures and human activities. They could take notes, fill a given form or take photos.
  Then, students observe and record folks around the green space, and classify them according to their occupations or activities there. For example, folks may rely on the green space to make a living, work or live nearby, take charge of it, take a rest or exercise in it, or just pass by.
- **Step 2 – Interviewing (2 h)**
  Dividing students into groups of 2-3. Each group is expected to interview people (2-5) in certain class of the classified folk. They could use a short questionnaire in which questions refer to the sense of place, satisfaction, demands or expectations towards the green space.
  Then, each group briefly conclude whether the present green space fit the rights and demands of the class they have interviewed, and if not, how to improve it.
- **Step 3 – Role playing (1.5h)**
  In a role-playing game, students discuss and make collective decision on how to improve the green space. Everyone plays a role standing for the class just interviewed in step 2. Students are encouraged to figure out a comprehensive plan giving consideration to different interest groups and the nature itself.
  Step 3 and 4 could be done either in classroom or outdoors, such as on a lawn.
- **Step 4 – Discussing and concluding (1.5 h)**
  Students share their feelings and findings in the survey and the game one by one.
  Then, they discuss about the major interest groups in this case, who is benefited and who is neglected, and the reason for the disparities.
  Finally, they review the process and outcome of decision-making in the game. Is the decision friendly and equal enough to the nature and all kinds of people? What are the troubles during the process and what do they mean?
CONCERNING BEE COLONY COLLAPSE

Pu, Tongyao, Environmental Science Student from Xi’an Jiaotong-Liverpool University, Suzhou, China
*This project is developed for the Urban Environmental Education course, Cornell University Civic Ecology Lab, April-June 2017

BACKGROUND

Bee is an important pollinator, which also of benefit to the society. However, bee is threatened by “Bee Colony Collapse Disorder” currently (which is abbreviated as “CCD”). More details could be got from https://www.epa.gov/pollinator-protection/colony-collapse-disorder.

AIM

- Help people understand the ecological and economy status of bee;
- Help people understand CCD;
- Enforce communication between citizens and beekeepers, farmers and other rural populations;
- Motivate people’s creativity towards possible solutions to CCD (optional).

REQUIREMENTS

Time:

Spring (It will be easier and nicer to observe bees in the wild, the more specific time largely depends on one places’ climate and weather. I will suggest April in my city).

Intended audience:

No specific requirement, but audience is expected to be suitable to accept knowledge about CCD and obey basic rules.

Other details:

The leader of this course should be able to have basic knowledges about bee and Bee Colony Collapse; The leader should make an appointment with a beekeeper.

ACTIVITIES

1. Ask people to do basic research about bees and bee colony collapse before activities; Let them prepare some questions for the beekeeper;
2. Tell people safety rules before the activity (Do not enrage bees; Take care when travel to mountains or lakes etc.);
3. Start: Observe bees in a specific area (like part of the mountain), observe bee’s death if there is any; Count bees if possible; Draw pictures based on the observation;
4. Have a chat with local beekeepers, invite the beekeeper to share stories of the apiculture (How to raise bees; The profit from apiculture; Problems they are facing etc.); People can raise questions if they have any. You can take videos for further promotion;
5. If possible, do some research about the surrounding environment (What is the situation of pollution; What is the situation about pesticides usage; What is the situation of climate; Is there any other factors in this place that would affect bee?);
6. Gather the group to reflect this activity (conclude the bee colony situation; come up with solutions if there are problems; conclude what people learned from this activity);
7. Count people and come back, finish this activity

EXPLANATION

1. There are beekeepers in my hometown East Hill, Suzhou. People here tend to enjoy the apiculture products very much. Here, beekeepers seem to relatively focus on one location and they would not transport their bees too far away, which would be quite different from the United States or other places in the world. Thus, educators could adjust this outline based on their situation. Also, compare could be made if people could have a view of different bee-raising style, which would be more interesting and meaningful.
2. This outline did not include too much details, but much work could be done if you want to figure out more detailed information. Thus, you could spend several days in this place to do research.
3. Observation and drawing part tends to encourage people’s appreciation towards environmental art.
4. The chat with the beekeeper could help people get more knowledge about apiculture, and should encourage people’s sense of place.
5. Bees in some places could suffer from climate change, if so, this would be a very explicit example towards this big problem.
6. This activity would also enhance youth’s ability towards communication and problem-solving.
Enhancing Communities’ Resilience through Social Capital

Project Concept for Nonformal UEE


"This project is developed for the Urban Environmental Education course, Cornell University Civic Ecology Lab, April-June 2017"

Project’s Goal:
To Develop Communities’ Social Capital and Collective Efficacy through Environmental Education

Objectives:
- Participants will be able to show real case examples of water conservation at house level.
- Participants will initiate activities enhance their resilience.

Period: 3 months

Target Audience: Mothers at homes

Background:
This idea was inspired by several chapters from the UEE course, such as Community Assets chapter 9, written by: Marianne E. Krasny, Simon Beames, and Shorna B. Allred. Specifically the idea “Communities with higher levels of social capital are more likely to manage natural resources for the collective good and to have the capacity to learn and adapt to environmental change”, and Community EE chapter, where CEE aims to enhance a communities wellness. Moreover, it is a Nonformal UEE program.

This Activity is part of an EE program targeting Syrian refugees within hosting communities in the north of Jordan, where water scarcity is a problem, where new immigrants and hosting communities are sharing a very limited water resource, which affects their well-being. This project combines water-harvesting systems at schools, and gray water systems with eco-gardens, in order to provide access to safe during water, and conserve other amounts of water, aiming to enhance the resilience of the hosting communities in Jordan for water service delivery.

Activity:
**Phase 1:** Step 1: Educator will engage the participants in activity to help them develop emotional connections; this might include a sense of a shared history where water resources were much more than the current time, or it might be a shared experiences related to dealing with water shortage or any other resources. The educator could ask the participant to tell a story to the group, why they are here in this workshop, what are their concerns of the environment, and if they would like to change it to meet their needs. What are their suggestions, what could they do individually, collectively. (This activity encouraged to be implemented through story telling as there might be less or non-educated women among the participants).

**Step 2:** Participants start telling their stories and they start making connections with the help of the educator to find common and shared experiences. Moreover, they start listing the solutions.

**Step 3:** Educator inform the participants about other practices around them, in schools which is developed to help the schools to access safe water, and reuse it in other practices.

**Phase 2:** Step 1: Educator organize field visits to the schools where the water harvesting systems, and gray water systems with eco-gardens established. Students of the school start discussing the projects with the mothers to inspire them for similar ideas. **Step 2:** Educator starts a Q and A session with the participants asking them to reflect on the visit, and if they would like to do something similar at their house level, whether they prefer to work on gray water, or water harvesting.

**Phase 3:** Step 1: Educator starts providing support for the groups to establish similar systems at their house level. And organizing visits to each other to share experiences. Educator could merge these visits with some cultural events.

**Step 2:** Participants starts formulating a society with membership system to encourage the feeling of belonging, and they starts then spreading the new knowledge to the other neighbors, and they could ask help from other members in the community and neighbors according to the skills and knowledge they have. **Step 3:** It’s encouraged here to develop an eco-garden where they could meet from time to time, sharing their ideas and spend more time to exchange experiences.