

Concourse Lake Native Plant Park: 6TH Grade Curriculum

SUMMARY

BEFORE YOUR VISIT: Students will learn about the basic needs of plants and the benefits of native plants. Students will learn about the natural water filtration capabilities of a manmade wetland environment. Students will prepare for a visit to the park by learning how to responsibly interact with nature and by discussing expectations for the visit.

VISITING THE PARK: Students will use plant and animal diversity in order to measure the health of the park. Students will engage in guided exploration to locate and identify living systems at the park. Students will measure the health of the systems at the park.

AFTER YOUR VISIT: Students will plan their own native plant park using the information about plant needs and structures as well as their own journals and observations from their visit to the Concourse Lake Native Plant Park.

Before Your Visit

1. Native Plant Pamphlet
2. Filtration Experiment
3. Staying Safe and Respecting the Space

1. Native Plants Pamphlet

OBJECTIVES:

- Identify adaptations that help a native plant to thrive in its habitat
- Describe the benefits of planting native plants

MATERIALS:

Camera
Pre-copied "neighborhood plants"- five copies for each pair of students
Rulers
Magnifying Glasses
Crayons, colored pencils, and markers
Access to the Internet

Ask the students to reflect on the plants and their needs.

- ✦ Ask the students to consider some of things plants need. (sunlight, water, soil, etc.) How could having more or less of those things affect how a plant grows?
- ✦ What other things in a plant's environment would affect how it grows and whether or not it thrives? (temperature, altitude, pollution and toxins, wildlife, people, etc.)

Ask the students to again take a blank piece of paper to draw a plant, but instead, ask them to fold the paper into thirds.

- ✦ In the first third, ask the students to draw a plant that they think would grow well in their neighborhood.
- ✦ In the second third, ask the students to draw a plant that they think would grow well in the desert.
- ✦ In the final third, ask the students to draw a plant that they think would grow well in a forest.
- ✦ Unfold the paper and ask the students to look closely at plants they have drawn and compare and contrast all of the parts of their plants. How are the roots different? Did they draw different kinds of flowers on the plants? Was there a size difference in the plants they drew?
- ✦ Do they think that they could see the second and third plants growing in their neighborhood? Under what circumstances?

Take a neighborhood plant walk.

- ✦ As a class, walk a three-block radius around the school (or ask students to complete the same walk around their homes). Bring a camera, "Neighborhood Plant" sheets, and drawing materials.
- ✦ Take careful note of all the plants you see on your walk. Fill in as much information as you can on your "Neighborhood Plants" sheet. Things to note:
 - ◇ Be sure to record all types of plants: plants in pots and planters, plants between the sidewalk cracks, trees, and grasses.
 - ◇ Be as specific as you can when describing and drawing the plants. Use the camera to take pictures of the plants to supplement your journaling. It'll be easier to identify the plants when you get back if you have as much information as possible.
- ✦ Make a class list of all the plants seen in the neighborhood. Use the resource list attached to this guide to help the class identify the plants.

Designate all the plants on the list that are native to this area and which are introduced.

- ✦ The term 'native plant' refers to plants that are indigenous to a particular area at a particular point in time. Typically it refers to plants that have grown without human introduction for a very long time. Some plants have a very specific area, complete with a very specific ecosystem, in which to grow. Other plants can thrive in a variety of places. Native plants typically have structures and adaptations that make them well-suited for their areas. Native plants play an important role in the ecosystem and often are critical for the health of all wildlife in a given area.
- ✦ What observations can be made of the list? Are there more native or nonnative species? Why do students think that's the case?

Discuss how native plants can be beneficial to all living things, including people and the other animals that live with them.

- ✦ Concourse Lake Native Plant Park is not only a beautiful testament to native Philadelphia plants, it provides various animals an appropriate habitat in the Centennial District. Review with your students some of the animals they might see while visiting the park. For a list, please see www.concourselake.org
- ✦ The plants at this park also serve an important function for the humans of Philadelphia. A green space like this one helps reduce pollution, noise and general congestion in a bustling city. More importantly, however, restoration of the plants to this park helps to improve the water quality of the lake, which is important for all the residents of Philadelphia. From the Concourse Lake Native Plant Park website: "Storm water from Concourse Lake flows under the Avenue of the Republic into Centennial Lake. Surface water from this two-lake area of the watershed flows to the Japanese Tea House and ultimately to the Schuylkill River, supplying drinking water to a large part of Philadelphia and its surrounding community."

- ✦ For a quick demonstration of how soil and plants can help to filter water, see the Environmental Protection Agency's website at http://water.epa.gov/learn/kids/drinkingwater/kids_4-8.cfm

Make an informational pamphlet on the benefits of planting native plants.

- ✦ Using what they have learned about native plants, provide each student with art materials to create a pamphlet that includes the following information:
 - ◇ Why local gardeners should plant native species of plants
 - ◇ How native plants could help the neighborhood
 - ◇ Some examples of native plants
 - ◇ Pictures and drawings
 - ◇ Information about the Concourse Lake Native Plant Park.

EVALUATION

Use the rubric point system below to evaluate students' work during the lesson. Score on finished project.

Three points: Students were highly engaged in class and group discussions; used materials appropriately; and pamphlet includes all required information and is completed neatly.

Two points: Students participated in class and group discussions; used materials with little assistance; and pamphlet includes four out of five of the required points and is legible.

One point: Students participated minimally in class and group discussions; were unable to use materials without teacher assistance; and pamphlet includes three or fewer of the required points or is sloppy or otherwise incomplete.

2. Filtration experiment

OBJECTIVE

- Describe the process by which wetlands act as a filtration system for water

MATERIALS

Bowls
Water
Plastic cups with the bottoms cut off
Sand
Mesh
Cotton balls
Cotton fabric
Dirt
Gravel
Food coloring
Hot chocolate mix
Coffee filters
Sponges (cellulose)
Charcoal fish tank filter
Sphagnum moss
Natural Sponge
Shredded newspaper
Rubber bands
Tape

Ask the students to give you a description of where their drinking water comes from. Talk about how water might go from a place like Concourse Lake to their kitchen sink. What has to happen before the water is potable?

- ✦ Storm runoff can pollute the water and make treatment for drinking even more difficult. The trees and other plants that have been encouraged in Concourse Lake are the first step in filtering the runoff. The plants themselves can filter out a small amount of the pollutants in the water. The trees in the wetland allow a very special system of microorganisms including algae and bacteria to grow. This very special mixture filters out up to 90 percent of the pollutants in the water that passes through it.

Give each pair or small group a cup of water. Instruct them to “pollute” their water with dirt, hot chocolate mix, gravel, and food coloring.

- ✦ How would they suggest making the water as clear as possible?

Lay out all of the remaining supplies. Ask the students to think about which of the things on the table would be helpful in filtering their polluted water. Allow them to test pieces individually with clean water.

- ✦ How does the water flow through? Will it catch the big pieces like gravel? Will it soak up the food coloring? What is their best prediction as to which combination of materials would filter the polluted water most completely?

Give each small group a bottomless cup. Instruct them to use any combination of the available materials to make a filter in the cup.

- ✦ They can choose to use any amount of material in any combination. However, they must be able to explain their choices based on their previous investigations.

Allow each group to pour their polluted water through the filter into an empty bowl. Collect the water and assign each bowl a clarity score between 1 and 5, 5 being the cleanest.

- ✦ Which materials worked best? Was it the manmade or natural materials? Were there some materials that worked well only when combined with certain other materials?

Play Wetland Tag in a large space like a gym or outside in an open field.

- ✦ Explain to the students that they will act out the filtration of dirty water by a wetland.
- ✦ Designate a small group of students as plants in the wetlands. Have them stand at regular intervals in one line across the field or room. Plants cannot move their feet, but they can reach around. The rest of the students will act as water. Their job is to run past the plants without getting tagged or “filtered.” If they get tagged, they were a pollutant and are out for that round.
- ✦ Let the students play one round where the water must flow past the plants. What happened? Did the plants filter out any pollutants?
- ✦ For the next round, designate several children as filtering microorganisms that live with the plants. Each plant can have two microorganisms that live with him or her. Microorganisms must hold the hand of a plant. They can move their feet, but they must remain attached to the plant (which can still not move his or her feet.) All plants and microorganisms can work together to get as many pollutants out of the water as possible. Allow the remaining students to flow past the plants.
- ✦ Let the students play another round with plants and microorganisms. What happened? Did more pollutants get caught?

EVALUATION

Use the rubric point system below to evaluate students' work during the lesson. Score on finished project.

Three points: Students were highly engaged in class and group discussions; used materials appropriately; and could completely and accurately describe the role of plants and microorganisms in the filtering of a wetland system.

Two points: Students participated in class and group discussions; used materials with little assistance; and could completely describe the role of plants or microorganisms in the filtering of a wetland system.

One point: Students participated minimally in class and group discussions; were unable to use materials without teacher assistance; could identify that plants and microorganisms live in a wetland system.

3. Staying Safe and Respecting the Space

OBJECTIVES

- Set expectations for the trip the park
- Determine appropriate ways of interacting with the natural space

MATERIALS

Our "Trip to Concourse Lake" sheet (see attached)

Chart paper

Markers

Ask the students to reflect on everything that has been discussed up to this point and think about what kinds of things (living and nonliving) they might see at the park. Write their ideas on the chart paper to compare to their experiences

- ✦ What kinds of plants might they see? Are there some plants they definitely think they will not see?
- ✦ Do they think they will see a lot of animals or only a few? Will there be large animals? Other than actually seeing the animals, what are some ways that they might be able to figure out if animals were present?
- ✦ What do they think the water will look like at the park? Will it be blue and clear or brown and scummy? Will it smell a particular way?

Talk with the students about some of the rules and important safety considerations on your visit.

- ✦ Use the attached "Our Trip to Concourse Lake" to guide your discussion with the students. Have them brainstorm some ways of exploring the space without causing harm to the plants and animals that live there. Write these rules on the chart paper and review them before your trip.

Visiting the Park:

1. Plant Mapping
2. Healthy Habitat Hunt
3. Plant Mapping

OBJECTIVES

Describe the biodiversity and health of Concourse Lake Park based on close observation of a sample section of park.

MATERIALS

Small wooden stakes
String
Measuring tape
Pencils
Notebooks
Rulers
Magnifying glasses

Sit the campers in the amphitheater at the park and ask them to describe the park from that vantage point.
What do they see? What do they hear? Their responses most likely will be superficial and general.

Split the class into small groups and tell them that they will be mapping small sections of the park to get an idea of how healthy the park is.

- ✦ Each group should take the stakes and string and find a 10'x10' section of park. They should look for an area of the park that they think has diverse plant life and may even contain evidence of animals.
- ✦ Instruct them to use the string and stakes to block out one-foot-square sections of their site. They will then draw a corresponding grid in their notebooks.
- ✦ Remind them of the previous rules while they are mapping out their site.
- ✦ Ask the students to look closely at each square and record all that they find in their notebooks. They should keep quantitative data, such as the number of a given plant in each section, as well as qualitative data, such as detailed drawings of the signs of living animals they find.

Discuss their findings.

- ✦ Bring the group back together and have each group share its findings. What trends emerge in the data? Are there sections of the park with a greater diversity of plants?
- ✦ Place the sample carefully on your sheet of paper. Divide the sample into its different components—living things, dead things (pieces of leaves, etc.), rocks, sand, clay, etc. Use your hand lenses to help you divide the soil into its parts. Could you put the soil back together exactly the way it was before you dissected it? Put the soil back into the hole that it came from.

Make the Soil

- ✦ Ask the students to look in their bags. Is what they have collected soil? Do they see that some of the things they have collected can be seen in the sample of soil that they dissected? What could they do to make the items in their bags look more like the soil they dug up?

- ✦ Have the students jump and pound on the bag of stuff. Add a little water from a water bottle. Does it look like soil yet? What might be missing? (Certainly decomposers, such as animals and other organisms that break down decaying matter in the soil.) Explain that the biggest missing ingredient is time. Over time (hundreds of years), and with the help of weather and decomposers, the rocks will break down and the leaves will decompose.

EVALUATION

Use the rubric point system below to evaluate students' work during the lesson. Score on finished project.

Three points: Students were highly engaged in class and group discussions; used materials appropriately; and were able to identify all of the components of soil.

Two points: Students participated in class and group discussions; used materials with little assistance; and were able to identify at least three components of soil.

One point: Students participated minimally in class and group discussions; were unable to use materials without teacher assistance; and were able to identify two or fewer components of soil.

2. Healthy Habitat Hunt

OBJECTIVES

- Identify adaptations that help a native plant to thrive in its habitat
- Identify the signs of healthy and unhealthy plant habitats

MATERIALS

Copies of the "Healthy Habitat Hunt" handout (see attached): 1 for each student
Map of Concourse Lake Native Plant Park
Pencils

Ask the students to think about what it means to be healthy.

- ✦ When we say someone or something is "healthy" what do we mean? This conversation will most likely be focused on people, but encourage the students to think about other living things.
- ✦ How would you determine if an ecosystem is healthy? Take some suggestions.

Allow the students to work independently or in small groups to complete the "Healthy Habitat Hunt."

- ✦ Some tips:
 - ◇ Designate an area for all the groups to work in to keep a closer eye on the independently working groups.
 - ◇ Allow the students to mark the places on their map where they find the evidence they need to complete each question. It will help in any follow-up discussions and allow you to better monitor their progress on the hand out.

Come back together and discuss your findings.

- ✦ First, lead a discussion of the hunt itself. Why were they asked the questions they were asked? For example, why is important to look at how many different kinds of plants are in a given area or if there is evidence of any animal reproduction? (If there is little plant diversity, that can mean that an environment is too hostile to allow a wide variety of plants, as only the hardiest survive. If animals are thriving in a healthy

environment, they are capable of reproducing.) What other things could they look at to determine the health of an ecosystem?

- ✦ What did they discover? Based on their results do they think this habitat is thriving? How do they think the choice to plant the plants that live here impacted the overall health of the park?
- ✦ How many of the “unhealthy” signs are a direct result of people using and misusing the park?

EVALUATION

Use the rubric point system below to evaluate students' work during the lesson. Score on finished project.

Three points: Students were highly engaged in class and group discussions; used materials appropriately; and correctly found, described, and labeled at least 8 of the questions on the hunt.

Two points: Students participated in class and group discussions; used materials with little assistance; and correctly found, described, and labeled at least 5 of the questions on the hunt.

One point: Students participated minimally in class and group discussions; were unable to use materials without teacher assistance; were not able to correctly find, describe, and label the questions on the hunt

After Your Visit:

1. Plan your Park

Plan your Park

OBJECTIVES

- Plan a native plants park that utilizes plants that are native to this region, allows for animal habitats, and is beneficial to the community

MATERIALS

Paper for each student
General art supplies

Talk about your visit to the park.

- ✦ What did students think of the park? Was it a place they would like to visit again? Do they think it improves the neighborhood? How do they feel about the park now that they know it improves the quality of their drinking water? Does the fact that it is a habitat for so many animals impact how they feel about it?
- ✦ Have the students make a list of the top 10 things they liked most about the park and share it with the class.

Plan a park.

- ✦ Alone or in small groups, ask the students to take everything they have learned—from the structures and needs of plants, to the adaptations of native plants to the signs of healthy systems—to create their own park. They should lay out their park in a drawing, and create a pamphlet/map much like the one that exists for the Concourse Lake Park. The pamphlet should include the following:

- ◇ A detailed map of the plants, water systems, trails, and any other features of their park.
- ◇ A mission statement for why the park was created
- ◇ A list of some of the animals one might see on a visit to the park.
- ◇ The top five reasons to visit the park.
- ✦ Things for students to consider:
 - ◇ What are the goals of their park? Are they looking for the park to be a beautiful place for their neighbors to hang out? Do they want a wetland like the Concourse Lake Park in order to filter water? Is there a lake in their park at all? Do they want a wild animal habitat right in the middle of Philadelphia? Or is it some combination of all of these?
 - ◇ How did they make the decisions about where to put their plants? How might that impact the health of all the plants in the system?
 - ◇ What animals do they expect to live in their park? Have they given the animals the appropriate food, water, and shelter that will keep them happy and healthy?
 - ◇ How will they keep their park healthy? What steps would they take to prevent some of the “unhealthy” signs they’ve discussed?
 - ◇ Allow the students to present their new parks to the class.

Tips

- ✦ Allow the students access to the Concourse Lake website for this activity. On the site you’ll find lists of plants and animals that would be appropriate for the students to use in their own parks.
- ✦ For this age group, you might find it helpful to limit the number of different plants to 8–10 so as not to be too overwhelming for the students.

EVALUATION

Use the rubric point system below to evaluate students' work during the lesson. Score on finished project.

- Three points:** Students were highly engaged in class and group discussions; used materials appropriately; and produced a pamphlet with all key components: map, mission statement, animals list, and reasons to visit the park.
- Two points:** Students participated in class and group discussions; used materials with little assistance; and produced a pamphlet with at least three key components: map, mission statement, animals list, and reasons to visit the park.
- One point:** Students participated minimally in class and group discussions; were unable to use materials without teacher assistance; and produced a pamphlet with 2 or fewer key components: map, mission statement, animals lists, and reasons to visit the park.