

Concourse Lake Native Plant Park: 4TH 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 man-made 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 look closely at the components of healthy soil. 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 Meet and Greet
2. Wetland Tag
3. Staying Safe and Respecting the Space

1. Native Plant Meet and Greet

OBJECTIVES

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

MATERIALS

Blank paper
Crayons
Pre-cut "Native Plant Meet and Greet" cards (See attached)

Ask the students to reflect on the plants they "built" in the previous lesson.

- ✘ What were some things that we determined that plants needed? (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 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?

Discuss how some plants have adaptations that allow them to thrive in certain environments.

- ✦ 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 need a very specific area complete with a very specific ecosystem 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 to the health of all wildlife in a given area.

Play “Native Plant Meet and Greet”

- ✦ Before you play: Print the cards so that the nametag on each card is printed or glued to the appropriate background card. For example, the “Hi, my name is Saguaro” card should be attached to the front of the “Saguaro Facts” card.
- ✦ For the first round, pass out the cards labeled “Environment” and the cards labeled “Plant” to the students. Some students may not have a card this round. They will play an important role in the next round.
- ✦ Students will be playing the role of a plant or an environment. Their goal is to find the student with whom they make a pair to represent a native plant in its native environment. They can find their match by asking each other questions and investigating the given picture. When they think they have found their match, they should sit down.
- ✦ When all the plants are in their native homes, bring the group together to discuss the game. What did the students find challenging about the game? What revelations were important in figuring out if they matched?
- ✦ Pass out the remaining ‘Wildlife’ cards. Have all the pairs stand up. This time, the animals need to find their habitats by comparing their needs with the plants and environment.
- ✦ Discuss the next phase of the game. Was it easier or harder? What could matching up the animals and the plants with a given habitat tell us about how these plants and animals are interconnected? What would happen if you changed or eliminated one piece of the puzzle?
- ✦ Take all the plant cards from the groups, shuffle them, and re-distribute them to the groups. What do the students think would happen if the plants that are best suited to their habitat have been switched out for these nonnative plants? What are some problems with this? (plants may not survive, animals will have a tougher time finding food, water, shelter, etc.)

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 Pennsylvania plants, but also 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 important, 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 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

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 matched native plants and animals to their native habitat.
- Two points:** Students participated in class and group discussions; used materials with little assistance; and correctly matched native plants or native animals to their native habitat.
- One point:** Students participated minimally in class and group discussions; were unable to use materials without teacher assistance; and repeatedly incorrectly matched native plants and animals with their native habitat.

2. Wetland Tag

OBJECTIVES:

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

MATERIALS:

Colanders
Funnels
Coffee filters
Water
Soil
Rocks (large enough that they will not go through the holes of the colander)
Cups
Bowls

Give each pair of students a cup of water. Instruct them to add a spoonful of dirt and a handful of rocks to their cup.

- ✦ Ask them to make observations about the water. What does it look like? Smell like? Would they want to drink it?
- ✦ How do the students think they could clean it? Take a few suggestions.
- ✦ Explain that this is like the water that would have been in Concourse Lake had the wetlands not been encouraged. Storm runoff can pollute the water and make treatment for drinking water even more difficult.

Give each pair of students a colander. Instruct them to pour the water through the colander into the bowl

- ✦ What happened? (The colander caught the rocks, but allowed the soil and water to pass through.) Make new observations about the water in the bowl. Is it cleaner? Does it look any different? Would they drink it yet?
- ✦ How do the students think they could clean it even further? Take a few suggestions.
- ✦ The trees and other plants that have been encouraged in Concourse Lake act very much like the colander in this demonstration. The plants themselves can filter out a small amount of the pollutants in the water.

Give each pair of students a funnel and a coffee filter. Instruct them to place the filter into the funnel and once again pour the water through.

- ✦ What happened? (The filter caught most of the soil.) Make new observations about the water in the bowl. Is it cleaner? Does it look any different? Would they drink it yet?
- ✦ How do the students think they could clean it even further? Take a few suggestions.
- ✦ 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.

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. Microorganism must hold the hand of a plant. They can move their feet, but they must remain attached to the plant (who 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. Soil Systems

2. Healthy Habitat Hunt

1. Soil Systems

OBJECTIVES

- Describe the components of soil

MATERIALS

For each small group of students:

Magnifying glasses
Onion bags or paper bags for collection and making soil.

For class demonstration

Trowel or soil augur
Sheets of white paper

Sit the campers in the amphitheater at the park and ask them to describe the park from that vantage point.

- ✦ Discuss what happens to the animals and plants after they die. Discuss the needs of plants for their growth: sunlight, but also nutrients and water that are absorbed through their roots. Discuss why fall leaves do not continue to pile up year after year. Tell them that today they will be exploring an important link in the cycle—dirt!
- ✦ When someone mentions dirt, what do you think about? Dirt is more than just messy—it is soil! What might soil consist of? (Take some answers.) If we dig into the soil, what might we find? Where do you think the soil comes from? Does anything live in or under the ground?

Ask your students to collect the ingredients of soil in small groups.

- ✦ Give the groups a bag to put their ingredients in. They may add anything they think would be important in the creation of soil as long as the object is not alive. That includes things like leaves that are still attached to their plants, insects, and grass that is still growing. If a part of a plant has already fallen off, then it is fair game for this activity.

Dissect some soil

- ✦ Ask the students what they think is in the soil. Using the augur or a trowel, dig up no more than two small samples of soil. Have the students investigate the soil sample. Do you see any layers in your sample? Are there different colors in the sample?
- ✦ 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. 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 bags of stuff. Add a little water from a water bottle. Does it look like soil yet? What might be missing? (Certainly decomposers—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

1. 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.