LESSON #1: INTRODUCING BIODIVERSITY

OVERVIEW:

This lesson is designed to elicit student preconceptions about biodiversity and introduce the concept of biodiversity through discussions, reading, and comparing photographs. The first activity students come up with a definition for biodiversity. Then they will evaluate the biodiversity at three different locations along a transect. For the last activity in this lesson, students will read a narrative that explains the science of biodiversity, and clarifies terms and concepts used in the first part of this lesson.

SUB-QUESTION:

What is biodiversity, and why does it matter?

WAYS OF KNOWING URBAN ECOLOGY:

		Students will…
	Understand	• Recognize that biodiversity is the variety of life at every scale of biological organization. *(ecosystem state and structure, scale)* • Understand that birds are good indicators of the health of an urban ecosystem. *(ecosystem change, ecosystem state and structure, human impact)*
	Talk	• Construct an argument for which site of three has the most biodiversity.
	Do	• Construct hypotheses about the biodiversity of three sites along a transect.
	Act	*No specific goals connected with acting on urban ecology in this lesson.*

SAFETY GUIDELINES:

No specific safety issues are associated with this lesson.

PREPARATION:

Time:

1 class period

Materials:

Activity 1.1

For each group:

> Color Copies of the images or access to a computer

For each student:

> Copies of student sheet
> Reading on Biodiversity

INSTRUCTIONAL SEQUENCE

Activity 1.1: Biodiversity in my Neighborhood

1. As students enter, remind them they are beginning a new module on biodiversity.
2. Ask students to brainstorm a definition for the term biodiversity. Some students may have already heard this term in another class, but for the students who have not, ask them to make their best guess.

   o Ask the students to write down their own interpretation of the word biodiversity and why biodiversity is important in their neighborhood in the spaces on their student sheet. Give them 3-5 minutes to write down their definitions/explanations of biodiversity.

3. Give the students a few minutes to brainstorm among themselves and invite them to share their ideas with the class. Write the students' ideas about biodiversity and the importance of local biodiversity on the board to allow the whole class to see the variety of responses.

4. Having students consider the ideas written on the board, have the class brainstorm how biodiversity might be measured by scientists. There is more than one possible answer. All answers that are feasible, should be considered. This concept will be the focus of the next lesson.

Teacher Background Knowledge
A definition of biodiversity is:

Biodiversity is the variety of life in all forms, levels and combination. The levels of biodiversity include genetic diversity, species diversity and ecosystem diversity.

There are many reasons why biodiversity is important generally, and in an urban environment specifically, such as:
- Resistance to catastrophe, as when a disease or organism attacks a specific species of tree. If there is diversity in the tree stock, the disease or organism will have less of an impact.
- Regulating the conditions of the environment, as each kind of organism in the ecosystem has an important role to play in maintaining ecosystem health and sustainability.
- Aesthetic, moral, and economic (services) benefits of biodiversity to humans.

Common Student Misconception
A common misconception that students may have is that urban areas will have little to no biodiversity. In general, urban areas do have less biodiversity than rural areas. However, it is important that students begin to recognize that urban areas can be rich in terms of biodiversity.

---

5. Tell your students that now that they have discussed what biodiversity is they will consider the possible biodiversity that could be found in different locations.

6. Each group of 2-3 students should have access to a computer or color handouts of the transect and three sites from the PowerPoint. Give students a few minutes to first compare and discuss what they see in each of the images and take notes on them on their handout. For each site students should:
   o Describe the habitat. What does it look like? (buildings, opens space, trees, parks)
   o Describe how these features might affect the levels of biodiversity.
   o Predict if they would expect this site to have a high or low biodiversity

7. Either in their pairs or as a class have students discuss their comparison
     o In comparing the three sites which site would you expect to have the highest biodiversity? The lowest? Would any of them have similar levels of biodiversity?
     o Would you expect to see different species in each site? Why or why not?

<u>Concluding the Lesson</u>
   1. Ask students to consider the driving question for the module, "How do we develop cities that sustain biodiversity?"
     o Ask them to discuss how some of the key scientific concepts in this lesson, such as the definition of biodiversity, transects, and the importance of birds, might fit into how they might write up their action plans for the field site to sustain or improve biodiversity.