

Module 1 • Ecology

Brief Overview

This module continues the urban ecology unit by engaging students in further understanding of the organization of ecosystems, and applying this understanding to culminating activities and stewardship projects within their urban ecosystem. Students should complete the pre-assessment as a way to demonstrate their basic understanding of the content from previous KidsGrow activities. Based on the results, teachers may choose to complete activities from the 2/3 curriculum or continue on to the lessons below.

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Time

7 sessions

Desired Outcomes

Students will:

- Explain the terms organism, population, community, and ecosystem.
- Identify the elements of their neighborhood ecosystem.
- Explain one example of how stewardship can improve an ecosystem.

What You'll Need

Materials

- Student folders (Journal, Handouts, Investigations)
- Pencils
- Pens
- Crayons
- Markers
- Butcher Paper
- Drawing Paper

(Optional) Paints

Worksheets and Handouts

- Schoolyard Ecosystem Investigation sheet*
- Stewardship Reflection sheet*

People Power_____

Contact Parks and People Foundation for assistance with designing the mural in Lesson 3.

New Vocabulary_____

Community

Many populations of organisms living together in one place.

Ecosystems

All of the living and non-living things living together in one place.

Maintenance

Upkeep or caring for something like a garden.

Organism

(Review) A living thing.

Population

A group of the same organism living together in one place.

Stewardship

The careful and responsible long-term management of something entrusted to one's care.

Careers_____

Students will learn about different occupations in ecology-related fields

- Ecologist

Preparing for the Lessons_____

Leaders will:

- REVIEW ALL NEEDED MATERIALS IN ADVANCE TO PLANNING THE LESSON!
- Review the lesson sequences and the lesson preparation directions.

- Review the “Background for Teachers” and useful websites prior to facilitating the lessons.
- Prepare areas in the classroom and hallways for storing/displaying student work.
- Clean/remove unsafe objects from outdoor areas where students will investigate.
- Identify potential parent or school adult volunteers.
- Identify possibilities for a stewardship activity that can be done in the neighborhood.

Module 1 • Pre-assessment • Urban Ecology

Module 1 Pre-Assessment – Grades 4/5 2009 – 2010

Before we start Module 1, we want to see what you may already know about **ecosystems**. Do the best you can, even if you are not sure of an answer. **IF YOU WOULD LIKE TO DRAW YOUR ANSWER, DO IT ON THE BACK OF YOUR PAPER.**

Name: _____

Date: _____

Class: _____

Teacher: _____

Grade: _____

1. What is an ecosystem?

2. Draw an ecosystem in the space below.



2. What does it mean to be a **LIVING** thing?

3. Read the list of items in Column 1 in the table below. In Column 2, write whether or not you think each item is a LIVING or NON-LIVING.

Column 1	Column 2
1. Grass	
2. Earthworm	
3. Mosquito	
4. Mulch	
5. Asphalt	

4. What are some things you will find in your **schoolyard and neighborhood** ecosystems? Make a list below.

Now, **label** each item on your list as either **living**, **once alive but now are dead**, or **never alive**.

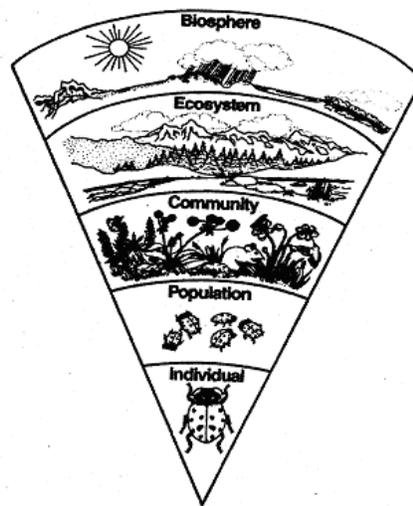
5. What are some ways you could conduct research on your neighborhood ecosystem? Write or draw your answer below.

Module 1 • Lesson 2 • Ecosystems Breakdown!

Background for Teachers

An **ecosystem** is a specific area of size in which non-living factors such as climate and landscape and living factors (plants, animals, and other organisms) are constantly interacting.

Levels of organization exist when describing ecosystems. **Organisms** are the individual living things in the specific area of the ecosystem. **Populations** are the groups of species that live in the ecosystem. **Communities** are made up of different populations of organisms in the ecosystem. Finally, **ecosystems** are all of the living and non-living things in the specific area.



From: <http://www.knowledgebank.irri.org/IPM/appecology/image3.gif>

Action Synopsis

Students will work collaboratively to learn the levels of organization in ecosystems designing large illustrations of different ecosystems and identifying the parts.

Time

2 sessions

Desired Outcomes

Students will:

- Explain the terms organism, population, community, and ecosystem.

What You'll Need

For Each Small Group

- A pencil

For Each Small Group

Session 1:

- 1 large sheet of butcher paper with 1 of each title: Ocean, Forest, Neighborhood (more can be added for additional groups such as Jungle, Desert, Pond)
- Crayons or markers in the following colors: red, orange, green, and brown
- Variation: To do this activity OUTDOORS, each group should have 5 colors of sidewalk chalk (ex: white, pink, green, blue, orange, and yellow)*

Session 2:

- Clipboard
- Schoolyard Ecosystem Investigation Sheets
- Hand lens
- A hula hoop or long pieces of string tied together in sizes similar to the size of a hoop
- (Optional) Crayons or markers

Note: It may be helpful to assign jobs to each student in the group. A recorder, artist, and a hand lens holder are some examples (all students should be making observations).

For Whole Class

Session 1:

- Vocabulary slides defining the terms ***organism, population, community, and ecosystem***.

Variation: For an added challenge, have the students research the terms above in a dictionary rather than present the slides to them.

Preparing for the Lesson

Leaders will:

- Read the “Background for Teachers” section at the beginning of the lesson.
- Gather all materials needed for the lesson

New Vocabulary

Community

Many populations of organisms living together in one place.

Ecosystems

All of the living and non-living things living together in one place.

Organism

(Review) A living thing.

Population

A group of the same organism living together in one place.

Assessments

The Urban Ecology pre-assessment will evaluate a student's prior knowledge of ecosystems.

Lesson Sequence

Session 1:

1. Review the term “ecosystem” by asking the students what an ecosystem is. Briefly discuss the things (living, once living but now dead) that are found in an ecosystem.
2. Explain to the students that they are going to learn about the parts of an ecosystem. First, they are going to draw pictures of different scenarios.
3. Distribute one of the butcher paper sheets (with title) to each group. Explain to the students that they will have 5 minutes (give or take a minute or two) to illustrate the title on their paper.

Variation: If doing this activity outdoors, students should select different areas on the blacktop on which to do their drawings.

Encourage students to think about all of the things that are found in those areas, both **living and non-living**.

4. Once 5 minutes have ended, have the students ROTATE to another picture. Explain to the students that they are to ADD detail to the picture that was started by the other group. Remind them that they are not to erase or cross out anything that has already been drawn; rather, they are making it more detailed. Allow the same amount of time for each group to draw as the previous group had.
5. Continue rotating until each group has added detail to each picture.

6. Once students have rotated, pass out one of the colored markers, giving the same color to each group. Introduce the word **organism** either by presenting the slide or having students look up the word in the dictionary.

Once the definition has been explained, have the students circle each individual **organism** in the picture in front of them.

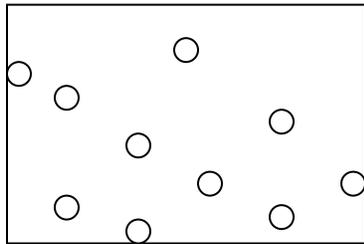
Students should have circled all of the living things in the picture, demonstrating that many organisms live in an ecosystem.

- 7 – 9. Repeat this process using different colored markers for the words **population**, **community**, and **ecosystem** (for this word, the entire picture should be circled).

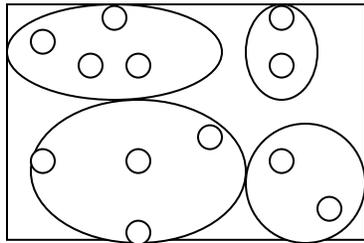
Students should see and be able to explain that each term includes more and more living things, but that an ecosystem is both the living and non-living things in an area.

Examples:

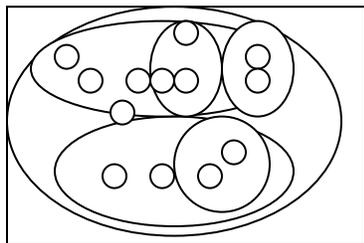
Organism:



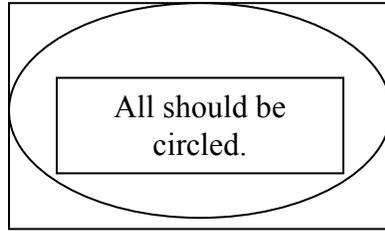
Population:



Community:



Ecosystem:



- When students have finished they can present their pictures to the rest of the class. Briefly discuss the levels of organization that are shown in each picture.

Session 2:

- Review the concept of ecosystems with the students. Review the terms *organism*, *population*, *community*, and *ecosystem* as it relates to the levels of organization in an ecosystem.
- Inform the students that they will be conducting research on an ecosystem found in their schoolyard. Ask the students HOW they can research an ecosystem in the schoolyard. (*Students should suggest using their senses of sight, touch, and hearing as means to conduct research.*)
- Distribute clipboards, hand lenses, and hula hoops/string to the student groups.
- Explain to the students that they are to explore their schoolyard and choose an area to study. They will lay out the hoop/string and study the ecosystem within that area using the materials given.
- Review the investigation sheet with the students, reading aloud each item on the sheet.
- Allow at least 30 minutes for students to conduct their investigations. When they have finished, gather the student groups and have them share their findings with one another.

Maryland SC Standards (4th and 5th Grade):	
<i>Standards are presented in the following format: (Grade)Standard.Topic.Indicator.Objective – Objective Statement</i>	
Science	
Standard 1.0 Skills and Processes: Students will demonstrate the thinking and acting inherent in the practice of science.	Applying Evidence and Reasoning (4)(5)1.B.1.a – Develop explanations using knowledge possessed and evidence from observations, reliable print resources, and investigations.
Standard 3.0 Life Science: Students will use scientific skills and processes to explain the dynamic nature of living things, their interactions, and the results from the interactions that occur over time.	Ecology (4)3.F.1 – Explain ways that individuals and groups of organisms interact with each other and the environment.

Module 1 • Lesson 3 • My Neighborhood Ecosystem!

Action Synopsis

Students will apply what they've already learned about their urban neighborhood ecosystem and create a mural to hang in their school.

Time

3 sessions

Desired Outcomes

Students will:

- Identify the elements of their neighborhood ecosystem.
- Explain the relationships between the living and non-living things in their neighborhood ecosystem.

What You'll Need

For Each Small Group

- A pencil
- Drawing paper

For Whole Class

- Large sheet of butcher paper (approx. 6 – 8 ft. in length)
- Crayons or markers (paints may be substituted)

Preparing for the Lesson

Leaders will:

- Gather all materials needed for the lesson.
- Teachers may want to sketch the title “My Neighborhood Ecosystem!” onto the butcher paper prior to students arriving.

Lesson Sequence

Session 1:

1. Invite students to sit in front of the chalkboard. Have your students brainstorm the things that are present in their neighborhood ecosystem and identify those things as living, once living, and never-living.
2. Discuss the relationships between the things that have been listed. Students should understand that the living things in the ecosystem depend on water, sunlight (plants), shelter, food, and space (air- oxygen for animals, carbon dioxide for plants) in order to survive.
3. Have the students design a mural to show the things that have been discussed. Students can brainstorm on drawing paper or on the board.

Sessions 2 and 3:

4. Students will create the mural based on their design and display it in their school.
5. When finished, they can present their mural to the school principal.

Maryland SC Standards (4th and 5th Grade):	
<i>Standards are presented in the following format: (Grade)Standard.Topic.Indicator.Objective – Objective Statement</i>	
Science	
Standard 3.0 Life Science: Students will use scientific skills and processes to explain the dynamic nature of living things, their interactions, and the results from the interactions that occur over time.	Ecology (4)3.F.1.a – Explain ways that individuals and groups of organisms interact with each other and the environment.

Module 1 • Lesson 4 • Stewardship Project (Service Learning)

Background Information for Teachers -----

*Stewardship is defined as the careful and responsible **long-term** management of something entrusted to one's care. Students of KidsGrow have an opportunity to plan and participate in a project to beautify and maintain the quality of their local ecosystem (i.e. schoolyard and neighborhood). Through long-term maintenance of the local ecosystem, students will not only feel empowered as stewards of their community, they will be able to share their knowledge with others in order to continue their progress.*

Action Synopsis -----

Students will think about the things they would like to improve in their neighborhood ecosystem and organize a project to make the improvement.

- Examples:
1. Organizing a schoolyard clean-up.
 2. Participate in a neighborhood clean-up.
 3. Plant new plants or trees in the schoolyard.
(Contact the Parks and People Foundation for this!)
 4. Plant a tree in your neighborhood and take care of it throughout the year.
(Contact the Parks and People Foundation for this!)

Time -----

1 – 2 sessions

Desired Outcomes -----

Students will:

- Define stewardship.
- Explain one example of how stewardship can improve an ecosystem.

What You'll Need -----

Materials will vary depending on the stewardship activity. **The Parks and People Foundation has resources for planting trees, perennials and shrubs, and can help with selection, garden design and implementing the project.**

Note: Disposable gloves and trash bags will be needed if students participate in a trash clean up in the schoolyard or neighborhood.

For Each Student

- A pencil
- Stewardship Relection sheet

Preparing for the Lesson

Leaders will:

- Contact the Parks and People Foundation for assistance with the stewardship project.
- Make the **Garden Maintenance Notebook**: Make several copies of the Garden Maintenance Checklist (see Leader Tools) and punch 3 holes into them. Put them in a binder. (Once the garden is planted the Notebook should be kept in a dedicated spot near the door.)
- Contact parent volunteers to assist with project.
- Gather all materials needed for the project

New Vocabulary

Maintenance

Upkeep or caring for something like a garden.

Stewardship

The careful and responsible **long-term** management of something entrusted to one's care.

Lesson Sequence

1. Invite students to sit in front of the chalkboard. Discuss the meaning of stewardship with the students. Have your students brainstorm ways in which they can demonstrate stewardship in their neighborhood ecosystem. ***Be sure to emphasize that stewardship is conducted over the long-term, and that demonstrating stewardship goes beyond a one-day project. Students should understand that while cleaning up trash in their schoolyard is helpful, true stewardship is maintaining their schoolyard by picking up trash on a regular basis.***
2. Organize and carry – out a stewardship project with the students.
3. Have the students complete the Stewardship Reflection Sheets and add them to their Journals.

Module 1:

Ecology

Worksheets and Handouts

Grades 4 and 5

Schoolyard Ecosystem Investigation

Names: _____

Directions: 1. Choose an area in your schoolyard to study by laying out your hoop or string.
2. Record your findings below.

Hypothesis: What do you think you will find in your area?

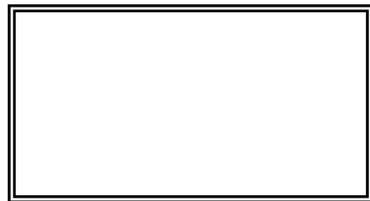
1. Describe the weather today: _____

2. Describe the location of the area you are studying:

3. List and draw the organisms that you have found in your ecosystem:





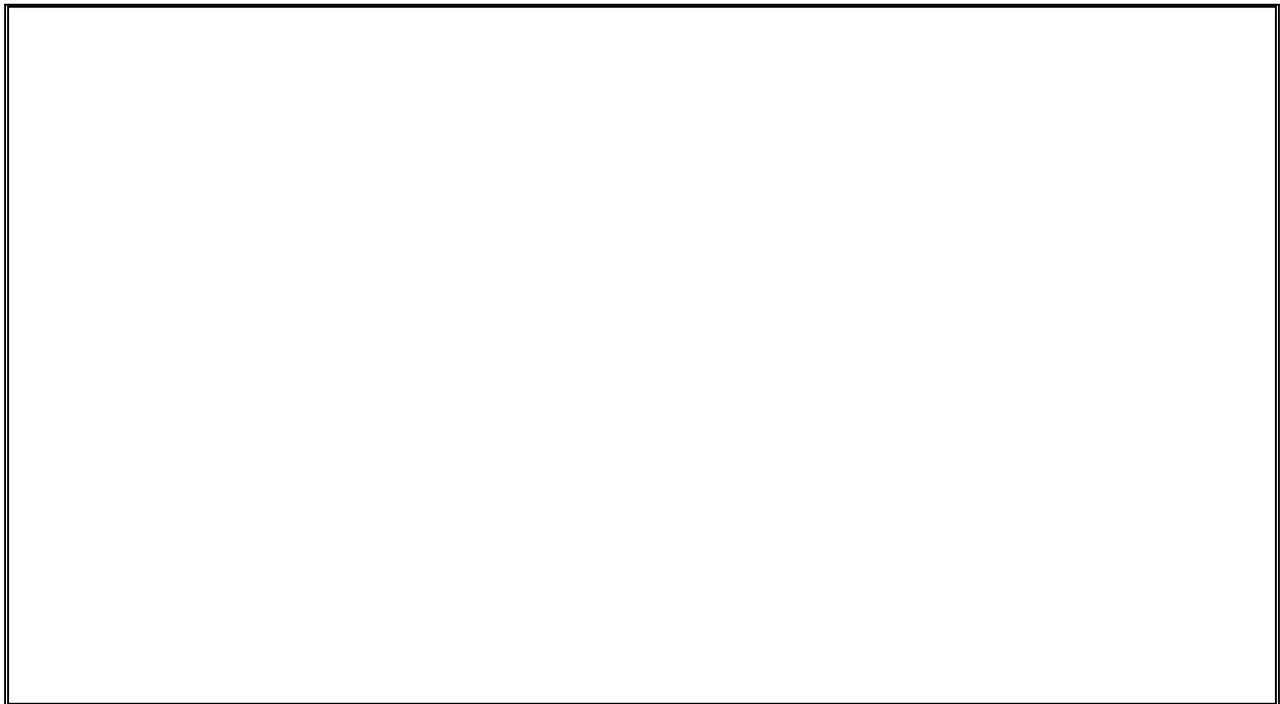




4. List the **populations** that you have found in your ecosystem:

5. List the **communities** that you have found in your ecosystem:

6. Draw and label the entire **ecosystem**:



Stewardship Reflection

Name: _____

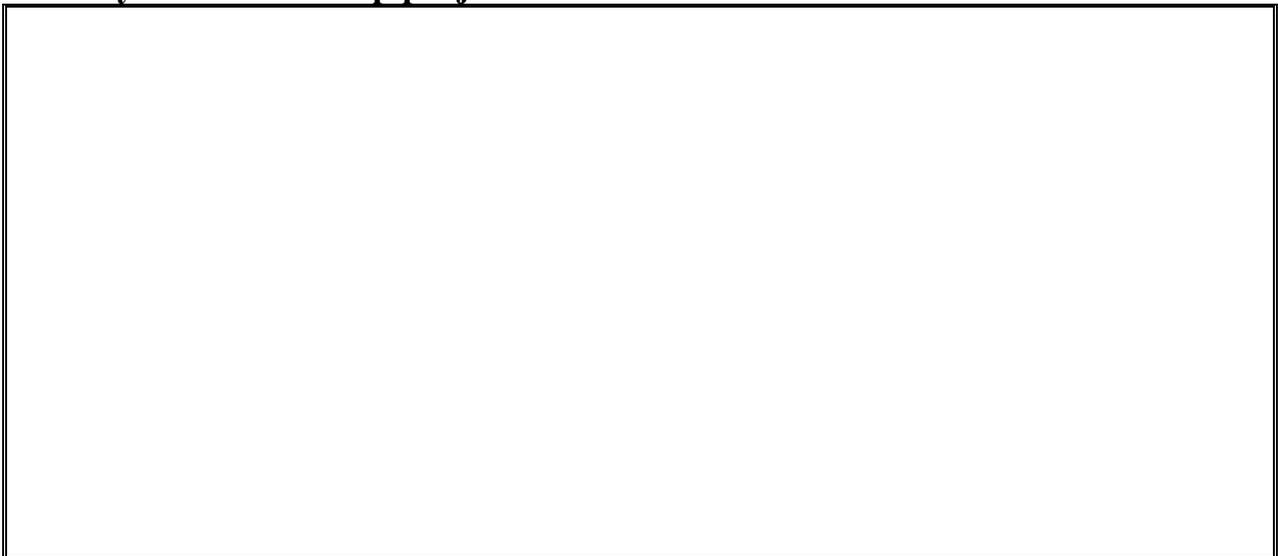
1. What is stewardship?

2. Why is stewardship important in your neighborhood ecosystem?

3. How did you feel when you finished the stewardship project?

4. What are some other things that you would like to do to improve your neighborhood?

Draw your stewardship project:



Module 1:

Ecology

Leader Tools

Grades 4 and 5

Module 1 Pre-Assessment – Grades 4/5 **Sample Answers**
2009 – 2010

Before we start Module 1, we want to see what you may already know about ecosystems. Do the best you can, even if you are not sure of an answer. **IF YOU WOULD LIKE TO DRAW YOUR ANSWER, DO IT ON THE BACK OF YOUR PAPER.**

Name: _____

Date: _____

Class: _____

Teacher: _____

Grade: _____

1. What is an ecosystem?

An ecosystem is all of the living and non-living things living together in one place.

2. Draw an ecosystem in the space below.

Drawing should include living and non-living items such as plants, animals, the sun, rocks, soil, humans...

2. What does it mean to be a **LIVING** thing?

(Answers will vary.) Living things get energy from food, grow, reproduce, and respond to changes in an ecosystem.

3. Read the list of items in Column 1 in the table below. In Column 2, write whether or not you think each item is a LIVING or NON-LIVING.

Column 1	Column 2
1. Grass	Living
2. Earthworm	Living
3. Mosquito	Living
4. Mulch	Non-living
5. Asphalt	Non-living

4. What are some things you will find in your schoolyard and neighborhood ecosystems? Make a list below. *Answers will vary.*

- _____ *People* _____ Living
- _____ *Cars* _____ Never alive
- _____ *Buildings* _____ Never alive
- _____ *Birds* _____ Living
- _____ *Squirrels* _____ Living
- _____ *Leaves on ground* _____ Once alive but now are dead

Now, **label** each item on your list as either living, once alive but now are dead, or never alive.

5. What are some ways you could conduct research on your neighborhood ecosystem? Write or draw your answer below. *Answers will vary.*

(Ground truthing would be a term to look for in this response.) I could walk around to look and listen for things. I could write what I see, hear, or feel in a journal. I could compare what I've recorded with what my friends have written in their own journals to see if we've made the same observations.

Schoolyard Ecosystem Investigation **Sample Answers**

Names: _____

- Directions:
1. Choose an area in your schoolyard to study by laying out your hoop or string.
 2. Record your findings below.
-

Hypothesis: What do you think you will find in your area?

(Answers will vary but may include grass, rocks, asphalt, plants, insects, glass, etc.) _____

1. Describe the weather today: Ex: Sunny, warm, breezy _____

2. Describe the location of the area you are studying:

(Answers will vary) _____

3. List and draw the **organisms** that you have found in your ecosystem:

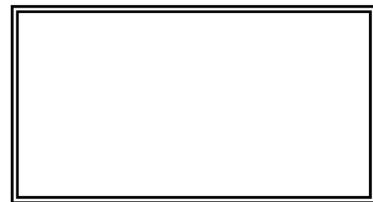
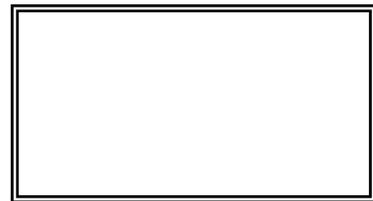
(Answers will vary)

_____ Ant _____

_____ Worm _____

_____ Grass _____

_____ Dandelion flower _____



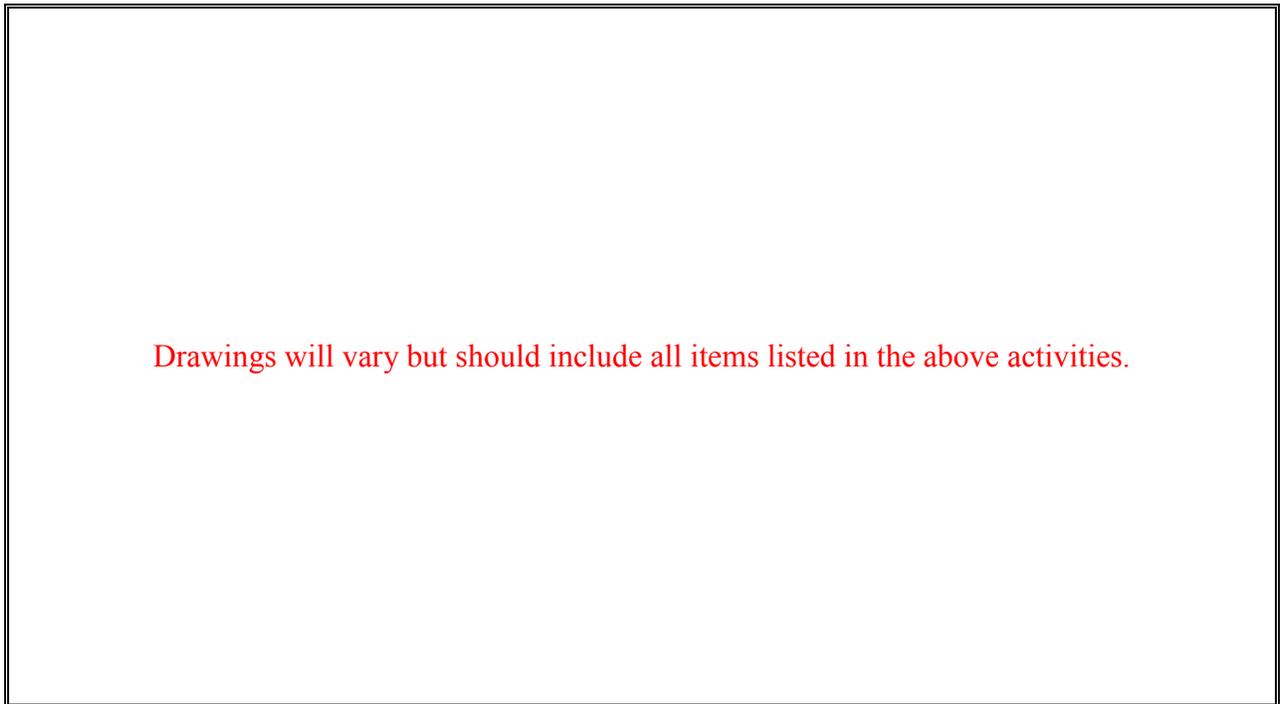
4. List the **populations** that you have found in your ecosystem:

Ants,
Worms,
Grass,
Dandelions

5. List the **communities** that you have found in your ecosystem:

Ants, worms, grass, and dandelions live together as a community.

6. Draw and label the entire **ecosystem**:



Drawings will vary but should include all items listed in the above activities.

Garden Maintenance Checklist

At least three times per week, make sure you take a small group of students outside to work on the garden and complete the tasks on the Garden Maintenance Checklist.

To Do	Completed By	Date	Comments
<p>Check the soil. If the soil is dry, water the plants or trees in that area.</p>			
<p>Pull any weeds that are growing in the garden or around the trees.</p>			
<p>Pick up any trash that may have blown into the garden or planting area.</p>			
<p>Check the condition of the plants: Do any look sick? Do any need to be supported? Anything else? <u>Write your observations in the comments section.</u></p>			