Draw Your Ecosystem

A Mountain Classroom Pre-Trip Curriculum Lesson Plan
**Lesson: Draw your Ecosystem**

Allow your students to explore surrounding ecosystems and discover examples of the components of the “Ecology House” in real ecosystems that surround them.

**Objectives**

Students will reinforce their understanding of the four components that make up the “Ecology House” - abiotic factors, biotic factors, cycles and changes.

Students will visually depict examples of the “Ecology House” in action in ecosystems that surround your school or community.

Students will envision the effects of a large disturbance or change in their ecosystem.

**Vocabulary**

**Ecology:** The study of how living (biotic) and nonliving (abiotic) parts of the environment interact with each other.

**Ecosystem:** A system formed by the interaction of a community of organisms and their physical environment.

**Abiotic:** Non-living factors in the environment. The abiotic factors of the environment include light, temperature, soil, climate, and atmospheric gases.

**Biotic:** Living factors in the environment.

**Cycle:** A natural process in which elements are continuously moved in various forms between different compartments of the environment. Examples include the energy, water, and nutrient cycles.

**Changes:** Differences or disturbances of the environment most often caused by human influences and natural ecological processes. Environmental changes include natural disasters, human interferences, or animal interaction.

**Preparation**

Pull together the supplies mentioned in the Materials box above.

Find an area outdoors—in your school yard, on your campus, in your community, etc. that can act as an “ecosystem” students can explore and draw. Ensure there are adequate examples of abiotic factors, biotic factors, and evidence of cycles in the area you choose.

**Accommodations**

This activity can be facilitated in a range of different environments, depending on your access and students’ mobility and comfort level. Any outside environment, or even a window looking outside, will work.

### Materials

- Paper
- Pens, Markers, Crayons, etc.
- Clipboards, books or any other hard surface to provide to students for drawing
**Activity—Part I: Draw your Ecosystem**

*Instructions:*

1. Bring your students outside to the ecosystem you’ve chosen to have them study. Make sure everyone has the clothing needed to be comfortable outdoors.

2. Explain to your students they are doing an activity where they will be tasked with visually representing the ecosystem.

3. To explain further:
   
a. Each student will be given a sheet of paper and markers, pens, pencils, etc. - clip boards or other hard surfaces will be made available to those students who’d like to use one.

   b. Each student should visually represent the ecosystem they are in—make sure to explain that the visual representations should include both pictures and words (Students who are more comfortable drawing could include more pictures than words; students who are more comfortable with words could include more words than pictures).

   c. Students should be especially focused on visually representing the abiotic factors, biotic factors, and evidence of cycles and change they see present in the ecosystem. They should include the name of what they are drawing (for instance: grey squirrel, bench, road, puddle, etc.) and label it using the ecosystem component’s name. Each drawing should include 5 examples of each category—abiotic, biotic, and cycles or interactions.

   d. Students can consider spatial aspects and where components are in relation to each other in their visual representations, or they could choose not to incorporate that characteristic.

   e. Give enough time for drawing but not so much that your students become restless.

4. Once your students have visually represented the ecosystem, challenge them to draw connections between different components of the ecosystem, which they could depict by drawing arrows between the two components and describing the connection with words.

*Discussion Questions:*

> Invite students to share their visual representations with the rest of the class. Did anyone make any particularly good connections between the components or mention good evidence of cycles or change?

> We can only see what is right there in front of us, but can anyone mention any other parts of the cycles related to the evidence we found? (We see the puddles, but we can’t see the clouds or precipitation that caused the puddles).

**Activity—Part II: The Effects of Change**

*Instructions:*

1. Now that your students have visually represented the ecosystem, they need to envision what it would look like after a major change or disturbance to the ecosystem.

2. To explain further:

   a. Using the ecosystem representation students created in the previous activity, they should brainstorm a realistic change or disturbance that could occur in this ecosystem (for instance: the tree falls down in a wind storm, the introduction of a new plant species, littering during lunch time, erosion from a heavy rain storm, etc.)
b. Once they've decided on the change or disturbance they'd like to represent, students will need to generate another visual representation of the ecosystem, but this time after the change or disturbance. Students should include depictions of how other components of the ecosystem will be affected by this change.

**Discussion Questions:**

What examples of change or disturbance did you choose to depict in your ecosystem? What effect did this change have on the other components of the ecosystem?

Are there any local examples (in the region around your school) of change or disturbance you can think of?
Standards

This online curriculum introduces and covers topics incorporated into the following national standards:

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<th>Next Generation Science Standards (NGSS)</th>
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<tr>
<td><strong>Grades 3—5:</strong></td>
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<tr>
<td>3-LS4-3 Biological Evolution: Unity and Diversity: Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.</td>
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<tr>
<td>5-LS2-1: Ecosystems: Interactions, Energy, and Dynamics: Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.</td>
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<td><strong>Grades 6—8:</strong></td>
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<td>MS-LS2-1 Ecosystems: Interactions, Energy, and Dynamics: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem</td>
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<td>MS-LS2-2 Ecosystems: Interactions, Energy, and Dynamics: Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.</td>
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<td>MS-LS2-3 Ecosystems: Interactions, Energy, and Dynamics: Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.</td>
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<td>MS-LS2-4 Ecosystems: Interactions, Energy, and Dynamics: Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations</td>
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