

EarthWorks Orchard Curriculum

The Ecosystem Game: Interdependence Between Plants and Animals

<b>Grade(s): 3-8</b>	<b>Topic: Ecosystems, Plant-Animal Interactions</b>	<b>Season: All</b>
<b>Timing:</b> 60 minutes including, 5 minutes RPK, 5 minute introduction, 10 minute game character prep, 25 minute outdoor interactive game, 10 minute outdoor ecosystem observation, 5 minute conclusion		
<b>Objectives:</b> <ul style="list-style-type: none"><li>• Students can define an ecosystem as (in their own words): <i>all the organisms in a given area, along with the nonliving (abiotic) factors (like air, water, sunlight, soil, etc) with which they interact</i></li><li>• Through a hands-on game, students experience how different animals in an ecosystem rely on one another for survival and compete every day for resources in their environment.</li><li>• Students can explain that ecosystems have delicate balances and that small changes can have a big impact</li><li>• Students can summarize the basic levels of a food web within an ecosystem: producers, consumers, and decomposers, and how they relate.</li></ul>		
<b>Materials:</b> <ul style="list-style-type: none"><li>• Character cards for <i>Ecosystem Game</i></li><li>• <i>Ecosystem Character Brainstorm</i> worksheet</li><li>• <i>My Part of the Ecosystem</i> worksheet</li><li>• <i>Ecosystem Game</i> instructions written out for everyone to see and refer to as needed during the game</li></ul>		
<b>Degree of need for extra teacher or parent helper?</b> Medium		
<b>Journal Prompt (to be written outdoors while looking at the schoolyard):</b> <p>How many different things can you identify in your schoolyard? Can you think of ways that they might be working together? Even if you picked just a plant you should be able to find some other things that depend on it or that it depends on. Draw and label as best you can every plant and animal in your part of the schoolyard and give your best guess about how each part is important to the others.</p>		
<b>Lesson Sequence:</b> <p><b>Reactivate Prior Knowledge (5 minutes)</b> Show students a feather and explain that it comes from a large bird, which is a predator in their schoolyard. Then show them a small leaf and explain it comes from a sprout in the schoolyard. Both of these things are part of the orchard ecosystem, but how are they connected? Together, fill in the different levels of the orchard food web.</p> <p><b>Introduction (5 minutes)</b> Ask the class, “what are the things that every animal needs? That every plant needs?” They should mention food, water, and shelter or space. Talk about how sometimes they need to compete for these limited resources in order to survive, and how some plants and animals thrive better in different environments, such as the desert or the rainforest. Explain that today we are going to start understanding how they all work together, and how they each have a special role within the ecosystem. Make sure that students understand why animals <i>have</i> niches, or special roles, in order to survive (what problems are there with everyone eating the same thing? Trying to find shelter in the same place?). Reinforce that if a plant or animal <i>doesn't</i> have a niche it won't survive (extinction). Use some examples of animals or</p>		

plants the class is familiar with to explain.

**Ecosystem Game Prep (10 minutes)**

Explain that today the class will play a game where they are each something in the ecosystem. First they will receive their game card, and then they need *become* their animal by answering some questions on the worksheet. Pass out the cards, making sure you have more prey than predators in the class, and the *Ecosystem Character Brainstorm* worksheets. Once students are done with the worksheet, have them practice sounding, moving, and walking like their character. Make sure they also identify their food source, shelter, and a water source.

**Ecosystem Game (25 minutes)**

Every student will have a different role in the urban (or a nearby) ecosystem and will be a part of keeping everything alive and growing and reproducing. Start by again, having the class remember what it is that organisms need to be alive and healthy (food, water, shelter/space, air). Explain that if their character does not get something to eat or water in a round, their animal will die, and they will become food for decomposers!

Students should identify the other students who prey on them or whose predators they are. Once every student understands their role, have them act them out and get comfortable with their part and whom else they have to interact with. Show them where the shelters are and make sure there is an identified water source (you may have to make a sign to designate an area) and plants for herbivore food (manipulatives can work well if you have to play indoors). Start the game and do one round normally. At the end, have students show you whether they got enough water and found some food in order to make it to the next round. In the next round start by removing something seemingly small, like a squirrel or a worm, and see how the ecosystem functions. Keep removing students until the system falls apart.

*Once the system has fallen apart* have the students reflect with you about what happened. Why did it fall apart? What was missing? Why was that a problem? What else did it affect? Did you know beforehand that it would be a problem? Were you surprised?

If you have time, do more rounds with changed in environmental factors that lead to different organisms thriving and surviving. Things to vary:

- Amount of Water
- Area of Shelter
- Game playing area (can pretend that a building was built on half of the ecosystem, for example)

Pass out and have students complete the *My Part of the Ecosystem* worksheet.

**Observation of Schoolyard Ecosystem (10 minutes)**

Now that we have talked a bit about ecosystems, students should be able to notice something about how living and non-living things interact in their schoolyard. Have students follow the journal prompt and record and reflect on what they think their ecosystem might be comprised of. Is it part of a bigger ecosystem? Do they notice anything new after playing the game? Do they see where the animal they played in the game might live, or where it might get water and shelter right here in the orchard?

**Conclusion (5 minutes)**

Review the results of the ecosystem game. Make sure it is clear that every part of the ecosystem is important for the system's health as a whole, from the microscopic decomposers, to plants, to pollinators all the way up to apex predators like hawks.

**Vocabulary**

Carnivore  
Competition  
Consumer  
Decomposer  
Ecosystem  
Habitat  
Herbivore  
Living  
Niche  
Non-living  
Omnivore  
Organism  
Prey  
Predator  
Producer

**Vocabulario**

Carnívoro  
Competencia  
Consumidor  
Depredador  
Descomponedores  
Ecosistema  
Hábitat  
Herbívoro  
Nicho  
No-vivo  
Omnívoro  
Organismo  
Presa  
Productor  
Vivo

**Extensions / Homework Ideas**

- Students can make costume pieces and props to go along with their character in the Ecosystem Game
- Students can play the Ecosystem Game again as a different character
- If students become extremely enthusiastic they can study the schoolyard to determine the precise plants and animals in the ecosystem and recreate the game to reflect the schoolyard more accurately.