

Teaching Connections

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Sample Themes for Ecosystem Programs:

- All members of an ecosystem, including humans, are connected to each other.
- Ecosystems are like a bicycle: when you leave parts out, it quits functioning.
- This ecosystem is the sum of all its living parts plus the non-living things that support it.
- Like a recipe for cookies, the recipe for this ecosystem includes all the right ingredients in just the right proportions.



Sample Activities

All these games teach ecological concepts of connectivity and interdependence. All are simple to do, require virtually no preparation and few if any materials. They can be quickly inserted into any nature program at the drop of a hat!

Circle of life: This is my favorite activity to start an ecosystem hike. I can use it as an overarching metaphor during the entire program.

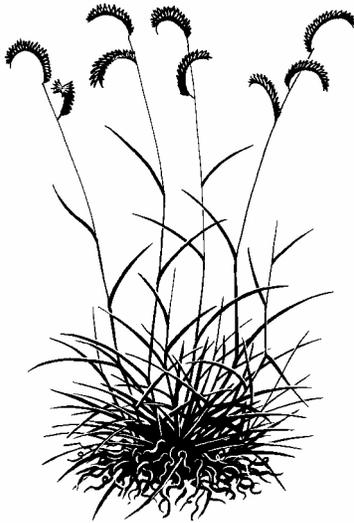
Every participant chooses an element of your ecosystem to represent: favorite plants, animals, fire, air, water, etc. If possible, try to make sure that humans and sun are part of the group, even if you have to choose one for yourself. Everyone forms a circle by holding hands. Stretch the circle to its very greatest extent. Everyone in the circle then leans back **on their heels**. They would fall on their butts except for the pull of other members in the circle. Ask participants what would happen if the water is polluted, and can't be in circle anymore. Yank the person representing water out and let the circle collapse. Repeat with a few other examples: "What if forest fires are taken from the circle?" or "What if all the mountain lions are shot?"

Note on including humans: Some people will argue that removing humans from the circle should have no effect on its function (or will make it function better.) I disagree! It is vital that our species comes to see itself as a member of the circle of life, not the axle about which it rotates. Without humans who care, wild places would not be protected and

the circle would shatter. Unlike other members of the circle of life, we have a choice about our relationship with the earth.

Solar Energy Pulse: A very nice add-on to the previous circle of life activity. Everyone should already be in a circle holding hands, and have chosen elements of the forest ecosystem to represent. The person who represents the sun squeezes her left hand on the right hand of the person next to her; that person passes the squeeze on, and so forth until the squeeze has been passed all around the circle and back to the sun and that all of us are solar-powered. Explain how all members of the ecosystem depend on the sun for energy. Try to get the pulse going as fast as possible: time with a stopwatch. “We can do better than that! The record was 2.5 seconds.” People get very excited by the challenge.

Human Knot: This old classic can be used to show how all members of an ecosystem must work together and cooperate to make a whole. Everyone forms a tight circle, shoulder to shoulder. Reach out with both hands and grab the hands of anybody across from you; avoid giving both hands to the same person. Then, without letting loose, untangle the human knot. At times the resulting shape is a single large circle – a circle of life -- other times two or three separate circles or interlocking rings. I have never seen a human knot that, with patience, was unsolvable. Conclude the activity by restating the ecosystem cooperation theme.



Do You Eat Grass Seeds? Grains like rice, corn, wheat and oats are the most important food sources for humans, and they are all grasses. Most people don't realize this, so you can surprise them by asking if they like to eat grass. Ask people what they ate for lunch or breakfast. Bread is made from wheat. “You ate ground up grass seeds!” Tortilla chips? “You ate mashed up fried grass seeds!” Oatmeal? “You ate flattened boiled grass seeds!” Without grasses, we'd all be pretty hungry.

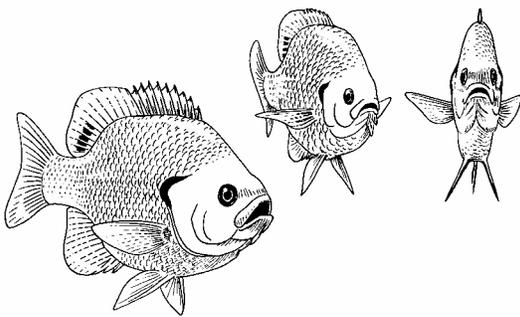
Food pyramid: (apologies to Joseph Cornell) Without explaining the game, have everyone pick the name of a favorite plant or animal in your area. Then make a food pyramid, plants on bottom, primary and secondary consumers on upper levels. (Have plants kneel, 1st lean on their backs without standing on them, 2nd lean on 1st from behind. Try to keep anyone from getting hurt or falling!) Clearly, the pyramid won't work since most participants want to be a top predator. Explain how there are many more plants than animals since plants collect energy (your participants can verify this: how many plants can you all see from where you are standing? How many primary consumers? A lot less!). Then ask your participants how you would re-do the activity to make the pyramid work. Some of those who chose to be animals will figure this out, and reassign themselves to become. You can also show what happens when there are not enough plants in the ecosystem -- pull out a few, watch pyramid fall down! Many, many plants are needed to support a very few top predators.

Carrying Capacity Jam:

I keep finding new applications for this game!

Find a stick and draw a circle about 4 feet across on the ground (or find a small delimited area, like a step on a trail). Then talk about limiting resources (in this case, space).

Competition for limiting resources is very tight in the natural world, and many plants and animals exist right at the edge (hungry most of the time). Many others don't make it. "So let's imagine that this circle represents all the resources available for your species in this ecosystem. When I count to five, any of you that doesn't have both feet inside that circle is dead. One! Two! Three! Four! Five!" There will be a sudden mad, surprised dash for



the circle, with much pushing and shoving and squabbling, and some participants won't make it. Try to restore order and discuss what it's like to live with limited resources. Was there competition to get into the circle? Yes, a lot. Point out how all the plants and animals around are competing: "Do you hear that bird singing? He's telling rivals to stay out of his share of the circle."

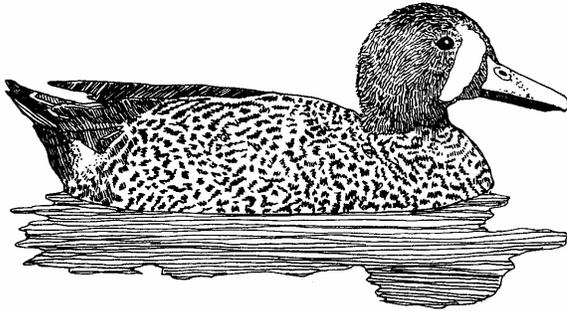
Variations: I use this activity to illustrate the overcrowding of forests in the absence of natural wild fires. Start by having three participants representing three pine trees stand in the circle. There will be room and space for all. Give them a cookie or snack bar to share. Then pack the circle full of participants – an overcrowded dog-hair stand of trees – and give them another cookie. There are only crumbs to go around.

To illustrate how noxious introduced weeds are destroying Colorado's ecosystems, ask everyone to imagine that they are a rare plant in your area. After they have crammed into the circle, point out that everyone with a blue shirt or jacket is really a knapweed plant, and show how many of the rare plants ended up outside the circle because knapweed got in first.

Cougar – Deer – Plant

Paper – Scissors – Stones is a game in which any two combinations will have a clear winner. The same is true of Cougar – Deer – Plant: Lions eat the deer, deer eat the plants, and (through the magic of death and decay) plants eat mountain lions. Divide a group of participants into two teams, which huddle about 50 feet apart, each behind a baseline you mark in the ground or with a stone or stick. Place a large stone, pack or other object equidistant between them on the ground. Each team has to agree to represent the mountain lion, the deer, or the plant. After they have agreed, both teams come up to the stone. When you count three, each team has to shout out its choice. If one team is the lion and another the deer, the deers must flee back to their base line while the lions try to tag them. Any tagged deers become lions and join that team. Then play again. If one team represents plants and the other lions, the lions must flee to their base line to avoid being tagged by the plants. And so forth!

Migration Hopscotch: When birds migrate they must stop to rest and refuel at refuges along the way. For waterfowl, these refuges are ponds, lakes and potholes between wintering and breeding grounds. To simulate the importance of these refuges, line your group up single file. With a stick, draw a series of circles each about 1 – 2 feet in diameter, about 3 – 4 feet apart, in a rough zigzag in front of the first person in the line. Each circle represents a lake or pond along the course of their migration. Each person must jump from pond to pond, like hopscotch, without missing a single step to complete the migration alive. Line them back up for the return migration, but ask them to imagine development that destroys some of the refuges: a farmer drains this pond to make a field (scuff it out with your foot); a parking lot is built on this one (scuff it out). With the chain of refuges broken, they will find the return trip much harder to complete! But then, some humans create or restore a wetland (scuff a new one in). People can do positive things for the environment as well as negative – and that’s an important lesson, too.



Resources for Educational Nature Games

Joseph Cornell, 1979. *Sharing Nature with Children*. Dawn Publications, Nevada City, CA. (916) 292-3482.

Joseph Cornell, 1989. *Sharing the Joy of Nature*. Dawn Publications, Nevada City, CA. (916) 292-3482.

Michael J. Caduto and Joseph Bruchac, 1994. *Keepers of the Earth/Animals/Night/Life* series. Fulcrum Publishing, Golden, Colorado. (800) 992-2908

Steven Van Matre and Bill Weiler. *The Earth Speaks*.

Acorn Naturalists. This excellent catalogue includes hundreds of fine educational books (including those listed above), models, replicas, teaching kits, puppets, tapes and videos, cheap but high quality field equipment, and much more. An outdoor teacher's best friend! (800) 422-8886 <http://www.acornnaturalists.com/store/>