Eco-Games

Capture The Sun

For those of you not sure, this game is "Capture The Flag" with an environmental twist.. Divide the crews up into teams. In general, you can do this by assigning crews One, Two and half of Three to one side and the remainder to the other side. Grab Tempera (not Acrylic) paint and paint faces to designate teams. Once everyone is marked, you are ready to begin...

Boundaries -
Side A is the western half of the field, the New Adventurer shelters, the sledding hill and the Ridge. Side A is not allowed to go up by the Lodge, down to the Waterfront, or onto the Basketball court. As usual, no teams are allowed in the Low Ropes Course.

Side B is the eastern half of the field, the Pavilion the Riflery range, Teepee Village, and Council Fire. Side B is not allowed to go by the stream, into the Green Low Ropes Course, up the hill by the cabins, into the Chapel or into the Old High Ropes Course. As stated above, they are not allowed in the Low Ropes Course on the far side of the field.

Rules -
1. Each team must go hide their "sun". To hide the sun, it must be at ground level (not above or below), and it must be "exposed". It cannot be buried, or wedged into a building, etc. It must also be out in the forest somewhere, not in any structure. Guards may be assigned, but they must always remain at least ten feet away from the sun.
2. Each team must designate a "jail". The jail cannot be in any building and/or structure. Guards may be assigned, but they must always remain at least ten feet from the prisoners.
3. When the whistle blows, the game begins. The object of the game is for a player from Side A to run over to Side B, steal the sun, and return to their own side without being tagged.
4. If you are tagged, you must go willingly with the person who tagged you to their jail. You cannot "escape" from them, nor can you run away from the jail. If the person who tags you does not stop to escort you to jail, you are free to go. (You have to give them a chance!)
5. If you are tagged with the sun, you must surrender the sun to the opposing team before going to jail. You may not throw the sun to another team member. Once you have it, it's yours.
6. If you are in jail, you must stay in jail. You may be "freed" from jail by a member from your team running into the jail without being tagged. At that point, the entire jail may walk safely back to their side. However, if, after being freed, you turn to run for the sun, you may be captured immediately.
7. If your paint comes off, you are not allowed to lie. If you do, your team forfeits.
8. Adults are judges and their decisions are final. If you have a problem, find an adult to settle the question for you.
9. The game ends with the whistle or the bell.

Wrap Up –
In nature, if two animals want the same food, who gets it? (The stronger and faster one.) If two plants are growing side by side, who gets the sunlight? (The bigger plant.) What happens to the smaller plant? (It dies.) If both teams were plants, which plant would be growing and which would be dead? Remember, it may not seem fair, but nature favors the stronger organism. Welcome to nature...

Eco-Charades

Intro: Prep the students by telling them to get their creative juices flowing!

Each study group will be given a note card on which there is written something that occurs in the natural world (i.e.: a hurricane). Study groups will be given 10 minutes to prepare. Each study group will be responsible for presenting their concept in front of the group - sound effects are ok, but no actual words or talking is allowed.

Presentations MUST include everyone in the group! After the group has presented, ask for someone to raise his/her hand if they think they know what the group was acting out. It's a fun activity that gives groups a chance to have fun and be creative - let them be creative and use props or whatever is appropriate to the game.

Note card ideas:

- a forest fire
- a beaver dam
- a rainbow at the storm's end
- metamorphosis (caterpillar changing into a butterfly)
- the life cycle of a frog
- a spider eating its prey
- baby birds being fed in a nest
- salmon making their way upstream
- seeds changing into flowering plants
- the dance done by bees to tell other bees where to get food
- ants raiding a picnic
- evolution of man <-- just kidding!

Hey! You're creative - add your own!

Environmental Tic-Tac-Toe

Environmental Tic-Tac-Toe comes in handy as a quick review game. Divide the crew up into two teams in the basement or in front of the chalkboard. Have them circle up so they can discuss the answers. Designate one team to be "X" and the other to be "O".

1. Each team will be asked a question from Concept Paths or from Main Events. The team will have 15 seconds to come up with the answer. Only one person in the team may raise their hand and answer the question. This prevents blurting out the answer and makes the team discuss the answer while figuring out who should answer it.
2. If the team answers correctly, they get to choose where on the Tic-Tac-Toe grid they can place their letter. The final placement decision comes from the person who answered the question correctly.
3. If the team answers incorrectly, the question is given to the other team. If they answer correctly, they get to place their letter on the board. If incorrect, the counselor answers the question.
4. The next question goes to the team who didn't receive the previous question.
5. Continue the game until a team wins the Tic-Tac-Toe game.

Tips:

- Tell the teams to discuss the answers quietly so they don't give answers to the other team.
- While one group is trying to answer the question, the waiting team should try to figure out the answer too, just in case it comes to them.
- Make the questions equal in difficulty. Don't ask one team to name three predators and the other team to name a 15 part food chain from Antarctica. If you give a hard question, just be sure the next one is at the same level. Teams notice this and get cranky.
- Have the teams rotate their spokesperson, so the same person doesn't answer every time.
- If the answer they give is not an answer that will be correct in Model Planets, don't accept it. They won't learn the correct answer if you let them slide.
- If you have time to play more than one game, keep score of "wins" to declare a winner. If a round ends with the no one winning the tic-tac-toe game (cat game), the counselor gets the point.
- If you decide to play two crews against each other, beware of hostility. This game gets fiercely competitive. This is where you have to play close attention to level of difficulty and what makes a correct answer.
- If you play crew vs. crew, have the counselor from Crew B ask the questions to Crew A, and vise versa. This eliminates the chance of perceived unfairness. The counselors also need to remain objective to the answers.
- If your crew wins, reward them!!!
- If not, you know what you have to work on. ☺

Lions and Zebras

(For those of you who have played "Sharks and Minnows", this game should look familiar.)

On the plains of Africa, there is an incredibly efficient predator. It is ferocious, and is noted for its ability to stalk its prey. What predator am I thinking of. (Lion.) Okay, we have a predator, but what is a predator without prey? I need to think of an animal that a lion might hunt. Hmm... Anyone have any ideas? (Zebras.) How good of you to guess...

All right, let's say you're a lion and you bring down a zebra. What do you do with it? (Eat it.) Yep! But, do you eat all of it? (No.) So, parts of it are left on the plains in the hot, hot sun. What happens to that? (It decomposes.) Bacteria comes and begins to munch on the carcass. Bacteria can also be disease-causing bacteria. Let's say I'm an animal and I brush up against an animal carcass. What could happen to me? (I die.) Well, let's play the game now...

1. Mark out a boundary with four cones. The width of the area should be big enough to allow all of the campers to line up in a straight line between two cones.
2. Choose two people to be lions, they stand in the middle of the field.
3. Everyone else are zebras, and must go stand between the two cones on the western side of the field (near the Wall).
4. When the lions shout "Go!", the zebras must run from one side of the field to the other. If they make it, they wait in between the cones on the eastern side of the square for the lions to shout "Go!" again.
5. If a zebra is tagged or runs out-of-bounds, they are dead (carcass). They must stand where they were tagged and attempt to tag others running by, thus spreading disease and death to other people.
6. If the dead zebra tags someone, that person, too, is dead, except if they are a lion. (We're granting lions total immunity to all diseases, otherwise the game becomes pointless...) They are not allowed, however, to stretch, step, jump or fall to make the tag. If they do, it does not count.
7. The last people tagged are the new lions. Restart the game and go!

Any questions?

Macro Invertebrate Mayhem

Intro:
Ask students how we can tell if a stream is healthy - what are signs of a healthy stream? How would it look? Smell? What would be in a healthy stream environment? Discuss changes to stream that make it unbalanced/unhealthy. (runoff, fertilizers and chemicals all contribute to a lower oxygen level in the water; construction/erosion add sediments that cloud the waters and cover fish eggs and make it harder to find prey; removing trees along the bank changes the water temperature which will impact certain species of plants and fish; changing water speed will also affect different species in different ways). All these things which change an ecosystem are called Environmental Factors or Stressors.

The Game:
The directions of this game have been adapted to suit our program. Each student will be handed an identification card prior to the beginning of the game. Everyone will start out as one of seven types of macro invertebrates (caddisfly, stonefly, mayfly, dragonfly, damselfly, midge larva, or rat-tailed maggot) or as an environmental stressor. Try to keep even populations of macro invertebrates.

For every seven macro invertebrates, there will be one environmental stressor (so a game of 16 individuals would have 14 inverts and 2 stressors). All of the macro invertebrates will live in a stream, a marked off area of a fairly good size. Because we already know the area to be affected by some stressors, some invertebrates have adaptations to help them get more oxygen (oxygen content in water is usually the first thing affected by stressors). Caddisfly larva need to slow down to get more oxygen, so all caddisflies must hop on one foot. Stoneflies need to travel backwards wherever they go and mayflies, which move their gills to get more oxygen, need to flap their arms and spin in circles as they travel.

Record population numbers for each invertebrate before round one. All invertebrates are to enter the stream for round one, which should be a timed 2 minutes long. At the start, environmental stressors (who should easily identified by wearing headbands of some sort) will have two minutes to tag as many inverts as they can. Tagged inverts should remove themselves from the game and trade in the invert card they have for another one (instructor who is handing out these "new lives" should be sure to hand them only rat-tailed maggot or midge larvae cards). Take a new population census before beginning round two of the game. Play for another two minutes. Have those who did not survive the second round get a new invertebrate card. Take one last population census.

Wrap-up:
Compare the population sizes for each species - Which species were the most affected by the environmental stressors? Which species were moderately affected? Which thrived? What does our last population census tell us about the health status of our stream? Concepts which might be introduced at this time are bio-indicators (species of animals which are sensitive to environmental changes and tend to be the first affected when stress levels rise) or species diversity and why it is good.

Muskox Maneuvers

Objectives:

Students will:

1. evaluate the effectiveness of some adaptations in predator/prey relationships
2. describe the importance of predator/prey relationships as limiting factors in wildlife populations.

Method:

Students simulate muskoxen and wolves in a highly involving game of physical activity.

Background:

Note: This activity was inspired by a "New Game" and adapted to teach concepts related to wildlife. Although this activity does not illustrate all the complexities of predator/prey relationships, it does illustrate broad concepts.

The muskox is a large, shaggy herbivore called "omingmak" or "the bearded one" by the Eskimos, or Inuit, as they prefer to be called. A male muskox may weigh over 600 pounds at maturity and mature females about 350 pounds. A young muskox may weigh only 19 pounds at birth. These animals are inhabitants of the artic regions of Alaska, Greenland and Canada.

Muskoxen are often found in herds of 20 to 30. Both sexes will vigorously defend the young, usually forming a line or circle around them, facing the threatening predator. Such a circle renders the animals relatively safe against natural predators, particularly wolves.

In this activity, the roles of bulls and cows are differentiated in ways not typical of actual muskoxen. Again, both sexes vigorously defend the young.

Materials:

Two different colors of rag flags to use as tails (like what is used to play flag football); there will need to be as many flags as there are wolves and calves.

Procedure:

NOTE: When dividing your group, use the following chart as your initial guide. You can vary the proportions in later rounds to respond to what happens in the simulations.

Total Players	Wolves	Bulls	Cows Calves
15-18	2	3	Equal or one more cow than calf
19-28	2	4	" "
29-35	3	6	" "
36-45	4	8	" "
46-50	5	10	" "

1. This is a highly involving activity! It is best done outdoors, in an open, grassy area; however, it is possible to do this activity indoors – even in a classroom – if tables, chairs, and desks can be moved in order to create a large space in which students can do some moving, including "tag-like" running.

2. Once you have established an appropriate physical area for this activity, divide your students into four groups. (For example, a group of 33 students will break down into three wolves, six bulls, 12 cows and 12 calves.) Each will have a distinct role.

3. This activity provides students with an opportunity to experience adaptation behavior of both muskoxen and wolves. Muskoxen are herbivores and often graze peacefully in meadowed areas. While grazing, they spread out. Calves typically do not stray too far from their mothers, but the animals do not always stay clustered – except when predators appear! Begin the activity with the students grazing peacefully as muskoxen and the wolves out of sight of the herd.

4. These are the behaviors each animal should exhibit:

   Cows: As soon as grazing begins, the cows should choose a lead cow to watch for predators. The cows should pick a signal the lead cow will use to communicate to the rest of the herd that predators are approaching. When the lead cow signals that predators are near, all the cows move to form a circle around the calves to protect the calves from the wolves. With the calves in the center of the circle, the cows stand with their backs to the calves, facing outward to watch the wolves. The cows can move very little. Mostly, they stay firmly in one place, moving their upper bodies to block the wolves from reaching the calves. The cows cannot touch the wolves with their hands or feet.

   Calves: The calves depend totally on the cows for protection. Each calf is to hold onto a cow with both hands, around the cow's waist, and only follow the cow's lead. Calves cannot influence the cow's movement.

   Bulls: The bulls are the active defenders of the cows and the calves. As the predators near, the bulls form a circle around the cows, who in turn are forming a circle around the calves. The bulls form as tight a circle as they can around the cows and calves, never any farther than one step in front of the circle of cows. The bulls can move, however – but only in a clockwise direction around the circle of cows. The bulls do have use of their hands. As the wolves attack the herd, the bulls try to "kill" them by pulling the flag out of their back pocket, or wherever the flag is attached to the wolf. When a bull kills a wolf, the wolf moves off to the side, "dead", but able to watch the remainder of the activity.

   Wolves: Wolves begin the activity out of sight of the herd. They try to get as close as possible to the herd without being detected. Wolves typically work as a unit so they can attempt a strategy for surprising the herd in order to kill the calves for food. The wolves are mobile, able to move at any time in any direction. They can use any

maneuver (except pushing and shoving) to break the herd's defenses. Once a wolf kills a calf – by pulling the calf's flag out of its pocket – temporarily stop the game and move the calf's carcass to the side, where it too can watch the remainder of the game.

A Note about Sound Effects: This is not a quiet activity much of the time. Wolves should be howling, communicating with each other in predetermined ways with signals and as part of their tactics to startle and confuse the muskoxen. The muskoxen moo loudly.

5. Muskox Maneuvers in Review: Muskox herd grazes quietly. Wolves are out of sight of herd. Wolves move in to attack herd. When lead cow spots wolves, the herd begins defense. A circle is formed, with calves in the center, cows facing out in a circle around the calves, and bulls in an outer circle, also facing the wolves. Each should behave appropriately, as described above.

6. The activity can conclude in several ways. For example
   a. All wolves could be killed.
   b. All calves could be killed.
   c. The wolves could give up in frustration after a period of time with no success in killing a calf.
   d. The wolves could kill one or more calves, and the activity would conclude at this time, based on the notion that the wolves are going to eat their capture and the herd move on.

7. Once the excitement and enthusiasm have peaked – sit down with the students to discuss what happened, and what the activity represents in terms of animal adaptation, predator/prey relationships, and limiting factors. Ask the students to describe and evaluate the predatory behavior of the wolves and the various defense behaviors of the muskoxen. What would happen if the wolves could not get into the herd? What would happen if the wolves always got into the herd? Ask the students to distinguish between what would be actual, typical behaviors of muskoxen contrasted with their behaviors in this activity.

Pass the Pulse

Background: Many animals communicate via touch or via chemical means. Prairie dogs identify each other by gently biting each other's front teeth. Ants communicate using chemicals to send messages of alarm or identification, spiders drum on webs.

Set-up: Divide the group into 2-4 equal lines and have the lines line up parallel with each other. Explain to the group that will be passing a message from one end of a line to the other without using sight or sound, but merely by touch. The message will be to pick up an object at the other end of the line. Have them link hands with the students on either side of them. At the beginning of the line have a volunteer/teacher/instructor make a signal (flipped coin, wink) that will indicate to the first person of each line whether or not to pick up the object at the opposite end.

Play: Have all the students close their eyes except for the first person of each line (the closest to the signaler). When the signal is given to pick up the object, the first person of the line starts a pulse by gently squeezing the hand of the person next to them. This pulse is passed all the way down the line to the end person who picks up the object. The person who picked up the object moves to the beginning of the line and becomes the new set of "eyes". Everyone rotates through and the first line to rotate completely through is the winner.

The Pollution Game

Objective:
To help kids realize that you can't always see pollution or where it comes from and that there are things the average citizen can do about it.

Focus:
Demonstrate the principle of vaporization (the changing of a liquid to a gas) by opening a yogurt container of cheap cologne while standing a small distance from your class. Make sure that the wind is behind you and going toward them!) Ask them to raise their hand as soon as they can smell the cologne. Vaporization is a common form of pollution, especially from rubber, plastic and paint factories.

Game:
For every twelve people in your class, choose three to be the first "pollutants". The pollutants stand in one section of the field designated as the factory. Some distance away, within the prescribed boundaries, the other nine kids are milling around in the town. The pollutants wear headbands to identify them, and when the instructor yells "A wind is a-blowin'" the wind carries the pollutants into the town, just like the wind carried the cologne to the students noses. The pollutants run around tagging kids. If the person gets tagged, he or she has ingested a pollutant and gets sick. The tagger must escort the taggee to the hospital/teacher where he or she is treated.

First tag: Tie a bandana around the leg, prescribe two "aspirin" and send them back out to play.

Second tag: Remove the bandana from the leg, tie around the arm. This person is now very sick and can no longer run. To move, s/he must hop on one foot, walk backwards, or just walk very slow.

Third tag: This person has expired and must sit out until the end of the round.

Processing:
Let each round go on for a good 10 –15 minutes. Let lots of kids expire in the first round. It is more effective this way. After each round, ask for numbers. How many people were killed by factory pollutants? How many got sick? How many weren't effected at all? Do you want to live in a town like this? What can we do about it?

Yellowstone Tag

Objective:
Students will play the roles of wolves and their prey animals in a game which simulates the predator/prey relationship.

Background:
To feed the whole pack, less energy is spent by successfully hunting large prey such as deer, elk and moose. To hunt these large prey animals, the pack must work together. One or two wolves may strategically drive the animal toward the pack which then surrounds the animal. Smaller prey such as beaver and rabbit are also hunted and when the food is very scarce, wolves may eat smaller rodents such as mice.

Though wolves are opportunistic hunters and will hunt any prey that they perceive vulnerable, the animals that wolves successfully hunt are usually not mature, healthy adults. The animals that cannot escape are usually the very young, old or ill. This natural process actually strengthens the prey animal population by leaving the strong and healthy to reproduce. By controlling the prey population in a natural way with wolves, the health and habitat of the herd is enhanced.

Wolves are not always successful hunters. Scientists studying wolves in Michigan found that out of every 16 moose that the wolves chased, only one was killed. The other moose either outran the wolves or successfully defended themselves and escaped the pack.

In the wild, wolves normally kill only what they need for food and eat almost the entire carcass. Because a week may pass between large hunting successes, a wolf may consume as much as 10 pounds of meat at one meal. As a wolf pack consumes a prey animal, pack structure and body language come into play. The strongest wolves will eat first, and the most, with the omega wolf sometimes being driven away from the food until all others have finished.

Game:
1. Set the scene by reviewing background information about the wolf's relationship to prey animals. Ideas and concepts that are relevant are: limiting factors in wildlife populations (what they need to survive), species adaptations, and methods of defense against predators. Also discuss what animals wolves hunt – from smaller mammals to large mammals, and the idea that wolves must work together to successfully hunt a large animal.
2. Give each player an identity card. See Table 1 for the breakdown, depending on the number of players. Tell players that some of the elk cards have a safety symbol on them, signifying that if wolves attempt to capture them, they will remain safe, and alive. When players receive their card, they should not reveal if they have the safety symbol.
3. Give the wolves headbands to wear, and five of the elk arm bands to wear, to help identify these animals. Rabbits need not wear any bands to identify themselves.

Table 1:

# of players	Wolves	Elk (safety)
15-18	2	4(1)
19-28	4	6(2)
29-35	6	9(3)
36-45	7	10(3)
46-50	9	12(4)

4. Students should know the characteristic behavior their animal will exhibit:
    a. Wolves: The pack chooses an alpha wolf who will be the pack leader before the game starts. The wolves should decide on a strategy – what animals they will hunt to gain enough food to feed the whole pack. If the pack decides to hunt elk, at least two thirds of the pack (or both wolves, if there are only two) must tag the elk. Specify this number to the wolves (and elk). As they tag the elk, the wolves count off LOUDLY from the first wolf to tag to the last. This will make it clear how many wolves have tagged the elk.
    b. Elk: Elk are herbivores and should begin the game grazing together in the playing area. If an elk has a safety symbol on its card, they should not show it until a group of wolves has successfully hunted it. The elk may then continue to play the activity. If an elk is killed and does not have a safety symbol, the elk gives the card to the alpha wolf and moves off to the side to watch the game.
    c. Rabbits: Rabbits are also herbivores and begin the game scattered about the playing area. Only one wolf needs to tag a rabbi to kill it. When a rabbit is killed, the card is given to the wolf and the rabbit moves off to the side to watch the rest of the game.
5. The Instructor will decide when to end the round of activity. At the end of a round, the wolf pack counts its food points to see if it fed its members successfully. Rabbits are worth one point and elk are worth five points. See Table 2 to determine pack survival.

Table 2:

# of players	Survival Points
15 –18	12 –15
19 –28	20 –25
29 – 35	35 – 40
36 – 45	45 – 50
46 – 50	50 – 55

6. After the first round, modifications can be made. For example:
    a. Add a competing predator, such as a coyote, who hunts only rabbits.
    b. Add a poison symbol to some of the prey cards, which kills tagging wolf.
    c. Change the ratio because of drought
    d. Add safe zones for the prey animals. They can have until the count of ten, and then must move on. Wolves have to wait ten paces from the safe zone.