

Predator – Prey

PURPOSE: To involve students in a highly active role-playing game that illustrates the dynamics of predator-prey relationships.

OBJECTIVES:

1. Understand the relationships between predators and prey.
2. Explain the terms “food chain” and “carrying capacity”.
3. Understand the effects of pollution in the ecosystem.
4. Know the components of a healthy ecosystem.

CONCEPTS:

Predator	Ecosystem
Prey	Habitat
Food Pyramid	

MATERIALS:

Chalkboard/Dry-erase board
Arm & head bands
Food, water, and shelter cards
Marker and whistle for each predatory instructor

PROCEDURE:

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| 1. Introduction (predator-prey, energy pyramid) | 10 min. |
| 2. Game Instructions | 20 min. |
| 3. Game | 55 min. |
| 4. Conclusion (charting survivors, limiting factors, carrying capacity) | 30 min. |
| 5. Journaling | 15 min. |

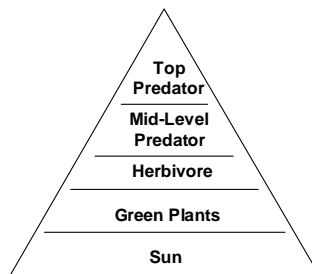
TEACHING TIPS

This is a high-energy game! Get the students excited about it! But there is roughly 30 minutes of introduction, so let the students know this. And get control of the large group by explaining that the more time that you have to wait for them to quiet down, the less time they have to play. This game can get very competitive. Remember that its for the students and not the adults. Make sure to prep by drawing the pyramid on the board beforehand. To aid in set-up, have two instructors set out cards while you are doing the rules. Set the food card where its fairly easily found as the entire prey population depends on it. Don't forget to build in regrouping time after the game and before the conclusion. Use common sense when attacking groups. If you have 50 students, and your target has 2, consider shortening the attack. Check with other departments for overlapping areas of use. Its okay to use a cheat sheet for the rules. But most of all...**HAVE FUN!**

Introduction

Welcome students to the game of a lifetime! A game of *SURVIVAL*. (Get them excited about it!) Now they need to listen closely, as there are lots of directions and the closer they listen, the sooner they get to play. We are going to go through the rules now, and, if the students have a question, hang onto it; we will answer all questions at the end.

Have the students define the terms “*predator*” and “*prey*”, then list some general differences in physical characteristics. Turning their attention to the food pyramid, discuss how the sun is the source of all energy on the planet. In the natural world, what is able to turn sunlight directly into food? Plants! And plants are at the base of the food chain. From here, discuss the relationships between the animals’ locations in the food pyramid, whether they are *herbivores* (plant eaters), *omnivores* (plant and meat), or *carnivores* (meat only), and their roles in the food chain – top predator, mid-level predator, or prey. *Note: Not all mid-level predators are omnivores.*



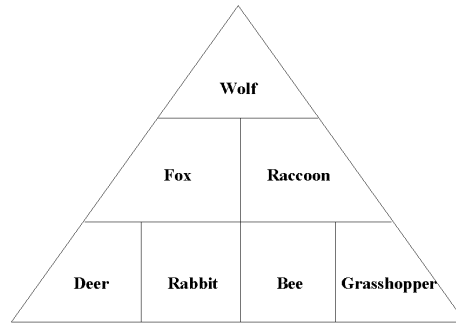
Just a quick review:

- Producers*** - Anything that can take in the sun’s energy and convert it into energy that other organisms can use. (These are the ***green*** plants.)
- Consumers*** - Anything that must eat other living things to survive. (These include the herbivores, omnivores and carnivores.)
- Decomposers*** - Anything that breaks down organic material back into soil. (These are not shown on the pyramid, but can occur on all levels (except, obviously, the sun).)

Next, have students identify the five basic needs - food, air, water, shelter, and space. (Since we are dealing with creatures living within their own natural ecosystems, we will assume that air and space are both available.) In the game, the students will be looking for food, water, and shelter. Would an herbivore need the same amount of food, water and shelter as a top-predator? Nope. So, all animals have different needs...

Instructions

And here’s how the game works...



Here is listed a sample Food Pyramid. This pyramid would correspond to a school with seven study groups. For more study groups, simply add more herbivores. As a note to all staff: be creative! Do **NOT** constantly use the sample Pyramid, but go off on your own! We have used food chains from different countries around the world (highly effective if you have International staff) and have even used Food Pyramids from Star Wars and Sesame Street!

Use the laminated map of the property to explain the boundaries. All students must stay within the designated boundaries at all times, even during attacks.

Each study group represents a different animal in the food pyramid, and the Instructor is the instinct. What is an “instinct”? (Instinct is knowledge gained over time.) What does the instinct do? (It guides the animal.) It is very important for the students to **stay within 15 feet** of their instinct (visually show how far fifteen feet is), otherwise it would be like a paw or the tail wandering off in a different direction than the rest of the animal. (I usually tell my groups that if they are more than 15 feet away, I will shout at the top of my lungs for my group to come back together, thereby revealing their location to all other groups on camp...) ☺

The animal groups need to find food, water, and shelter in order to survive. These are represented by wooden cards (food = red / shelter = yellow / water = blue) that are randomly placed around the playing area before the game begins). When an animal group finds a card, everyone must touch the card at the same time and the entire group must sign a song, tell a joke or do a dance. This represents the time it would take the animal to eat food, drink water, or build a shelter. After this is done, they can move on, but the **card stays** for other groups to find. As mentioned above, for survival, different animals need different amounts of habitat to survive.

Prey -	1 of each
Mid-level Predator -	2 of each
Top Predator -	3 of each

If a group has found all of its needs before the end of the game, it is still a part of the game until the bell rings, and so must attack or hide accordingly. The game ends when the dinner bell rings.

Attacks

Ask students how else a predator can gain food besides finding food cards. **ATTACK!** The way attacks work is this.

1. To tell the different animal groups apart, the top predators wear headbands on their heads,

the mid-predators wear bands on their upper arms and the prey simply go “as is”.

2. Once the game begins, the top-level predator must wait 10 minutes before attacking, the mid-level predator must wait 5 minutes. This allows the groups to spread out.
3. For a predator to “eat” a prey, the instinct for the predator group blows the whistle once to begin the chase. The attack lasts 30 seconds, during which time the predators attempt to tag as many prey as possible. This is the only time students can separate from their instinct. After 30 seconds, two whistle blasts are blown and everyone returns to their instinct. Any students that were tagged during the attack join the predator group. (Don’t worry about having them put on bands, they are guilty by association...)

To make sure that all students are accounted for, the predator should tell the prey group how many of their members were captured and care should be taken to make sure that the total between the two groups represents the total number of students that should be in that area.

4. Prey that is eaten by a predator counts as follows:

5 prey =	1 food card
10 prey =	2 food cards
15 prey =	3 food cards

If you have a smaller school, this number will need to be reduced.

5. Top predators can attack anyone, and mid-level predators can only attack the prey animals. The mid-predators cannot attack each other, and the prey animals cannot attack anyone. (Attacks can only go DOWN the pyramid).
6. There can be no double attacks (i.e. The wolves and the foxes cannot gang up on the rabbits. Nor can the wolves attack the foxes while the foxes are attacking the rabbits).
7. Predators can only attack one group at a time.
8. A predator group must wait *five minutes* before attacking the same group again. However, they can attack a different group right away, or a different group can attack the group that just was attacked. (e.g. After the wolves attack the rabbits, they have to wait five minutes to attack the rabbits again. However, the wolves can attack the raccoons and the fox can attack the rabbits right away.)
9. Animal groups **CAN** be attacked while at the habitat cards. If this happens, the prey group will need to dance/sing/joke at the card again for it to count.
10. If a student goes out of bounds during an attack, he/she immediately becomes tagged and

must go with the predator group.

Conclusion

Bring everyone back in and calm them down. They'll be excited and telling war stories, but they can do that later. This is everyone's chance to find out who survived and who did not. Make a chart on the board as follows:

	F	W	S	# at Start	# at End	Survive?
Wolf						
Fox						
Raccoon						
Deer						
Rabbit						
Bee						
Grasshopper						

Ask one student from each animal group who survived as that animal throughout the game to tell the following information: how many food, water, shelter cards did they find? How many students did they start with? End with? (If they have only one left, they have still survived the game.) Did they survive?

After compiling the list, go back to the original pyramid and remove any animal groups that did not survive. Ask the students:

1. Does this pyramid represent a healthy or an unhealthy ecosystem? Why? Bring in the concepts of:

Carrying Capacity - *The maximum sustainable number of animal that can live in an ecosystem for an extended period of time.* (Be sure that they understand the concept of carrying capacity! It s often hard to get across.)

Limiting Factors - *Things that control the numbers of individuals in a population, e.g. flood, fire, disease, hunting.*

2. The effects of a possibly contaminated water source and how it moves up the food chain. (i.e. who drank water from the pond? What if runoff from the road had polluted that water? If mice drank the water and the foxes ate the mice, what then? Etc....).
3. What was realistic/unrealistic about this game?
4. What was it like to be a predator? A prey? Both?
5. What are other limiting factors besides food, water and shelter?

Congratulations on a game well played! Dismiss into small groups.

Journaling

Questions are already printed and most often in their journals.

Additional Information

Inclusion: There are additional roles that can be added to this game to involve all students.

- *Poison Water Card*: This is a great way to get a student with low motor or mental skill involved. How it works: The student is given a water card and a marker/pen. When animal groups came to collect the water card the student lets them know what they have to do in order to collect the card. After they have completed the assigned task, their hands are then marked with an “X”. Students should not tell others what the mark means. During the wrap-up of the game the instructor can inform the group that there was a polluted stream/pond within the boundaries. Then take another look at the results. Yes, the rabbits collected all of their basic needs, but they have a mark on their hands. This means that the water that they drank was polluted. How would this affect your group? How might this affect the rest of the pyramid? (Bioaccumulation, the poison working up the food chain).
- *Hunters*: Used if a student is high functioning, but might not be able to run continuously, broken arm, or other needs. Sometimes you may want to just do this role for fun with a teacher or responsible adult. How it works: the student is turned into a hunter. There is a St. Croix hunting license in the pred/prey bin with rules on it. The rules are:
 - Hunters may only walk.
 - Hunters may only capture one animal per attack.
 - If a hunting party, the party must stay together.
 - Tagged animals get returned to a prey group.

Wrap-up stuff: did the animals know that there was going to be a hunter? Was that realistic? How did the hunters affect the food chain?

- *Roving food card*: Yet another idea to get everyone involved. Just as it sounds. Give the student the sole food card, and they walk around with it. It only counts as one food even if you find it at a different location. It is still the same card!