

Predator or Prey?



Next Generation Science Standards Disciplinary Core Idea: LS4.C Adaptation

For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all.

Disciplinary Core Idea: LS4.D Biodiversity and Humans:

Populations live in a variety of habitats and change in those habitats affects the organisms living there.

FIELD STUDY OVERVIEW

During this Field Study Activity, students will play an **Outdoor Learning Game** to model how coyotes, fox squirrels, grey squirrels, acorns, and humans interact in a local environment and discuss adaptations that make the organisms well adapted or not-so well adapted for the environment. During the **Environmental Exploration**, students will observe physical adaptations of trees and other plants. As a **Stewardship Activity**, students will remove invasive plant species.

GUIDING QUESTIONS

- What do all animals need to survive?
- How does the population size of predators vs. prey animals in an ecosystem affect one another?
- What adaptations help animals find food or avoid becoming prey?

OBJECTIVE

Students will be able to demonstrate their understanding of the relationship between predator and prey populations in an ecosystem by acting out the different trophic levels within a given food web.

STEWARDSHIP ACTIVITY

Students will participate in a stewardship activity lead by staff at the Field Site. This may involve removing invasive plant species and/or collecting and planting seeds.

EXPLORATION GUIDELINES

While exploring, take note of remnants or leftovers from a meal that an animal ate before you got there; lots of animals leave behind bones or plant parts that are not edible.

MATERIALS

Educators at the Field Site will provide the following materials:

- 4 to 6 cones to mark off a large playing area
- 4 hula-hoops to serve as safe zones
- 8 brown beanbags (to represent acorns)
- Appropriate number of colored armbands for each food web component (brown for coyote, black for grey squirrel, orange for fox squirrel, green for car)

Predator or Prey? Procedures

Procedures

1. Set up cones to form a large rectangle that will serve as the playing field. One of the short sides of the rectangle will serve as the start line, and the opposite side will serve as the end line.
2. Spread the brown beanbags and two of the hula-hoops evenly around the playing field.
3. Explain to students that they will be acting out different roles representing the different components of the food web during winter in a local environment.
4. Assign the appropriate number of students to each role, using the table below as a guide. Distribute the colored armbands accordingly, and have students tie them on their arms.

Food Web Role	Prop	Ten Students	Fifteen Students
Coyote	Purple Armband	2	3
Grey Squirrels	Black Armband	3	5
Fox Squirrels	Orange Armband	4	6
Car	Green Armband	1	1
Acorns	Brown Beanbags	6	8

5. In each round, the coyotes start the game in the playing field. The car will be blindfolded and walk across the playing field with his/her hands in front of his/her body. Note that the car should walk instead of run to ensure the student's safety.

6. The gray squirrels and fox squirrels line up on the start line of the playing field. The goal of the squirrels is to collect enough acorns and make it to the other side of the playing field without being tagged by the car or coyotes. Once play has started and the squirrels are in the playing field, they can temporarily stand in the hula-hoop safe zones. However, only two players can stand in each safe zone at a time.
7. All organisms must gather what they need to eat to survive before getting eaten by something else. Once a player collects all of the necessary food items, he or she can run to the end side of the playing field.
8. The necessary items to collect for each role are:
 - coyotes - must tag 2 squirrels to survive.
 - grey squirrels - must collect 1 acorn to survive.
 - fox squirrels - must collect 1 acorn to survive.
9. Coyotes and the car collect squirrels by tagging them. When squirrels are tagged, they must stop, hand over their armband to the player who tagged them, and step out of the playing field for the remainder of the round.
10. Allow 2 to 3 minutes of play for each round, or until all squirrels have either been tagged or made it across the end line. Any coyotes that have not collected two squirrels did not survive the round because they did not find enough food.
11. After each round, have students reflect on the outcomes, and allow them to play a different role in the next round.
12. After each round, discuss the following questions: How many squirrels are left? Are there more fox squirrels or grey squirrels left? Why? How many coyotes are left? Why?

ROUND 1 – It is spring, summer, or fall, and the coyotes can hunt for both types of squirrels.

ROUND 2 – It is winter, and the coyotes cannot see the grey squirrels because they visually blend into the snow. The coyotes can only hunt for fox squirrels during this round and cannot tag grey squirrels.

ROUND 3 – Add two extra hula-hoop safe zones to make a total of four. Explain that people protected the natural habitats of the organisms and allowed them to expand. Remove the car. Because the habitat is now protected, there is now protected there is less traffic in the area.

ROUND 4 – Remove two of the hula-hoop safe zones from the previous round. Explain that these safe habitats were removed due to human development in the area.

ROUND 5 – Remove the remaining two hula-hoop safe zones so that none remain. Explain that these safe habitats were destroyed by pollution that was caused by humans.