



Exploring Population Dynamics

Research Objective: Data Collection and Analysis

Description

In this activity, you will become part of a food web! You will model the relationship between predators and prey while exploring how food availability, shelter, and population size can affect an ecosystem. By playing several rounds of a predator-prey game, you will collect data and use it to create a graph showing how cottontail and coyote populations change over time.

Procedures

Predator-Prey Tag

1. Your instructor will divide the class into Cottontails and Coyotes.
2. There should be about 1 Coyote for every 4 Cottontails.
3. Cottontails will begin at the Permanent Shelter.
4. Your instructor will spread food tokens throughout one side of the playing area.
5. Chalk will be used to mark temporary shelters throughout the playing area.
6. Coyotes will spread out across the playing field before the round begins.
7. Each round will last 5 minutes. (4 rounds)

Cottontail Rules

1. Your goal is to collect enough food to survive the round.
2. You must bring 3 food tokens back to the Permanent Shelter.
3. You may only carry one food token at a time.
4. You may stay inside a shelter for as long as you want.
5. Coyotes cannot tag you while you are inside a shelter.
6. If you do not bring 3 food tokens back to the Permanent Shelter before the round ends, you do not survive.

Coyote Rules

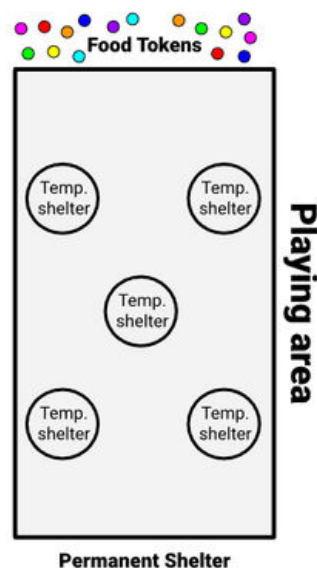
1. Your goal is to catch a Cottontail.
2. You must successfully tag at least 1 Cottontail during the round to survive.
3. Cottontails cannot be tagged while they are inside a shelter.

Materials

- Chalk
- Bandanas
- Bingo chips or other food tokens
- Pencil
- A designated playing area

Tips

You will play **4 rounds total**. Keep track of the starting and ending populations after each round, and pay attention to how changes in the number of Coyotes affect the number of Cottontails!





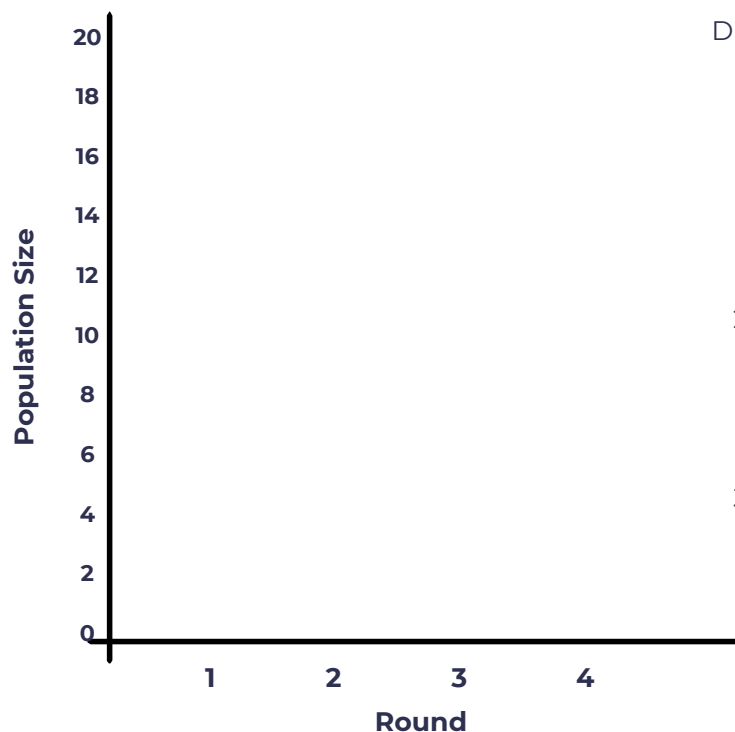
Exploring Population Dynamics

Student Investigation

Before each round, record the starting number of Cottontails and Coyotes in the chart. Play each 5-minute round, then record how many of each species survived. Repeat for Rounds 1–3. After Round 3, double the number of Coyotes compared to Cottontails, play another round, and record the results and any observations.

Round	Starting Cottontails	Starting Coyotes	Cottontails Surviving	Coyotes Surviving
1				
2				
3				
4 - more Coyotes				

Use the data from your chart to create two line graphs on the same graph. Choose a different color for each species, then plot and connect the Cottontail population for each round and do the same for the Coyotes. Be sure to create a key showing which color represents each species.



Discussion Questions:

1. Explain the impact that an increased Coyote population had on the Cottontail population.
2. How did the availability of food and shelter affect the Cottontails' ability to survive?
3. What does the game show you about how changes in one population can affect other organisms in an ecosystem?