

Title of Lesson: Introduction to Ecosystems

Overview and Objectives: The student will learn: what animals need to survive (water, food and shelter), how populations change in response to their environment, how to model population changes, how to understand carrying capacity, and how to analyze predator-prey relationships. This lesson is open to students with varying degrees of language acquisition.

Materials and Resources:

Open space (outdoors or a gymnasium)
Graph paper
Coloured pencils
2.5 x 2.5 cm brown construction paper squares (several hundred)
7.5 x 7.5 cm blue cardboard square (this can be reused within the simulation)
Pictures of: deer, snowshoe hare, lynx
Predator-Prey Handout

Vocabulary:

Water, food, shelter, resource, carrying capacity, predator, prey, population

Body of the Lesson:

DAY 1

Play “Oh Deer!” (from Project Wild, a K-12 conservation education program (<http://www.projectwild.org/>)). Show the picture of the deer. Ask the question “What does the deer need to survive/live?”. Respond to student answers (final answers should include water, food and shelter). “This game will show you how a group of deer living in a forest (a population) changes depending on how much food, water or shelter is available. This is the sign for water (put hands to mouth). This is the sign for food (put hands to stomach). This is the sign for shelter (put hands peaked like a house roof above the head).” Have the students practise the signs with the words until they are comfortable. Repeat the signs without modelling the movements. Choose 1 student to be a deer. The student and the rest of the class should be a comfortable running distance apart (around 20 m, although this can be easily increased or decreased depending on the group). The deer should be positioned facing away from the rest of the class. The rest of the class should form a line. They will face away from the deer. “Everyone, make your sign. The line is the resources, all of the things the deer might need. The deer will make the sign for what it needs—water, food or shelter. On the count of three, the deer and the line of resources will turn around to face each other. No changing the sign!” The deer must run across the space and tag a resource that matches its need. Resources don’t move. The resource that is tagged needs to follow the deer back to the starting place. There are now two deer. The teacher should keep a tally of rounds vs. number of deer. Repeat until either the students have lost interest or 2 or 3 population peaks and valleys have been recorded.

Return to the classroom. Put the data up on the board. Have the students graph the data so that the number of rounds is shown on the x-axis and the number of deer is shown on the y-axis. Remember to

title the graph appropriately. Discuss what patterns the students see on the graph. How would they describe the data? What caused the deer population to increase? What caused the deer population to decrease?

Draw a line roughly through the middle of the peaks and troughs. Explain that this is the carrying capacity, the number of organisms (deer) that the environment can support. Have the students label the carrying capacity on their own graphs.

Extensions: How was the game similar to the real world? In what ways was the game dissimilar to the real world? Are these the only things that cause a deer population to increase or decrease in the forest? What other things change the deer population? Would you expect to see increases or decreases?

DAY 2

Show the students pictures of the lynx and the hare. Who eats who? Explain who is the predator and who is the prey.

Help the students to measure the meadow and play the first 2 or 3 rounds of the “Predator-Prey Simulation”. Help them to record the data accurately. Let the students work on collecting the data.

DAY 3

Students will still be working on collecting data.

Once they have finished, they need to graph the data and answer the questions on the handout provided.

Scaffolding: Help the students to answer the questions by giving examples.

Assessment:

Raw data, graphs and answers to the predator-prey simulation questions can be collected for assessment. Adjust assessment expectations to the student’s ability to communicate in English. Students beginning to learn English can share their ideas using pictures and words to communicate their ideas. They should link vocabulary to a picture. Students with intermediate to advanced English should show their work in complete sentences that use the vocabulary covered in class. Listening to collaborative work during the game is a great opportunity for assessing learning skills.