

Exercise: Plants versus animals: the game

Students can use their Animals versus Plants charts as they play to decide winners in each contest.

With this scenario acted out by the students, a random animal encounters a plant with a single, randomly chosen defense.

1. Each student gets two sheets of cards. Cut out the cards. Plant trait cards should be decorated with green.
2. Divide the cards into two piles: Animals (deer, monarch caterpillar, StJohnswort beetle) and Plant traits (wax, leaf hairs, tannins, latex, thorns, hypericin).
3. Shuffle the cards.
4. Divide the class into pairs. In each pair, one student takes all the plant cards—this student is the plant. The other student takes all the animal cards—this student is a consumer.
5. Each student takes a card at random (without looking) from their pile, and puts it down.
6. With this, the scenario that the students are acting is one in which a random animal encounters a random plant with a single defense.
7. If the plant trait is one that the animal can handle (circled on the chart), the animal eats the plant and wins a point. If the plant trait is one that the animal can't handle (X'ed on the chart), the animal can't eat and dies, and the plant survives and wins a point.
8. Keep track of points.
9. Play until the cards run out. Each student will win about half the time.
10. Question for the students: Does having an adaptation mean that an animal is definitely going to eat and survive? Answer: NO. An adaptation only helps with ONE set of environmental conditions (or one kind of plant defense), it doesn't make an animal better at dealing with ALL environmental conditions (or all plant defenses).

It is rare for an animal to have only one type of food available. With this scenario, a random animal encounters two plants.

1. The plant student puts out two plant cards, picked at random from the pile. Each card represents a separate plant.
2. The animal student puts out a randomly picked animal card.
3. If the animal can eat one or both of the plant cards, the animal removes ONE plant card, and the animal gets a point and stays on the board.
4. If the animal stays on the board, the plant person puts another random plant card on the table.
5. If the animal cannot eat either of the plant cards on the table, the animal dies and the plants survive. The plant person gets a point, and both plant cards stay on the table.
6. Keep track of points, and play until one player runs out of cards (they may not run out at the same time).

7. Question for the students: What does having more food choices mean for the animals? Answer: Animals should on average be more likely to survive. This is why it is important to preserve plant biodiversity—it helps consumers to survive as well.

Many plants, like milkweed (latex AND leaf hairs) have more than one form of defense against consumers, and many consumers are able to tolerate more than one plant defense. In this game, each student chooses her side of the interaction.

1. Each student picks up two cards from their pile, and looks at them privately.
2. The plant student chooses a card and lays it down.
3. The animal student looks at the plant trait, and chooses one of the two cards that he is holding to lay down.
4. If the animal can eat the plant, the animal student gets a point. If the animal cannot eat the plant, the plant student gets a point.
5. Played and held cards are discarded, and each student picks up two new cards from the pile. The winner of the previous hand plays the first card.
6. Repeat until all the cards are gone.
7. Question for the students: when you could make choices, did you always win? Answer: NO. Adaptations can help animals and plants to survive, but they do not totally guarantee survival.

For middle school instructors: You can use the Animal versus Plant Chart to calculate the chances of survival for the plant, the animal, or each animal species in each round.