In the [Alligator] Weeds

Outdoor Wonders and Learning™

Students will learn how introduced non-native species can affect the populations of native species in this competitive game of survival.

Elaborate/Apply

Supplemental Reading

Invasive Plant Species (Invaders from Earth)

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Grade Levels:

3, 4, 5

Curriculum Correlation:

NCSCS—Science
3.L.2.2
4.L.1.1, 4.L.1.2, 4.L.1.3
5.L.2.2, 5.L.2.3

Materials:

100 blue poker chips, 100 white poker chips
Species indicators (name cards, pictures, etc.)

Duration:
40 minutes

Location:
Outdoor Study Area or open space

Procedure:

1. Ask students what the needs of all living organisms are (food, water, shelter, space, and air).
2. Introduce the game by describing to students that they will participate in a simulation. Explain to the students they will randomly be picked to be dragonfly larvae, crayfish, or bass over the course of the simulation. Ask students if these organisms need the same amount of food or oxygen in order to survive.
    - Discuss the relationship of the different species within this ecosystem. Ask them which organism is highest on the food chain and which one is lowest. Which need more or less energy? What makes you think that? Could this b
3. Make a circular boundary that indicates the borders of the aquatic ecosystem. Scatter 100 blue poker chips and 100 white chips inside the circle. When you are ready to begin round one of the simulation, tell students that they need to collect as many poker chips as possible.
4. ROUND 1: Have the students play until all of the poker chips have been collected. Explain to students that each species needed to collect a certain amount of food and oxygen:

	Oxygen (White Poker Chips)	Food (Blue Poker Chips)
Dragonfly Nymph	5	5
Crayfish	7	7
Largemouth Bass	10	10

5. Each species mush have the minimum number of white and blue chips to survive and make it to the next round of the simulation. Survivors continue as the same species for next round while the students that did not make it will sit out with the teacher.
    - Record the number of surviving species and the number of deceased species

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6. ROUND 2: Remove all of the chips that were collected by the non-surviving animals in the game. Scatter the chips from all of the survivors back into the ecosystem. Mention to students that the ecosystem has changed. An invasive species called alligator weed has been introduced to the ecosystem and begun to multiply, this has caused some of the food and oxygen resources to disappear. Begin the next round reminding students that even though there are less chips, each species still have the same amount of requirements to survive. Students that did not survive the first round will observe during the second round.
    - Do not be surprised if most of the students survive this round. Record the number of surviving species and the number of deceased species.

   NOTE: Alligator weed disrupts the aquatic environment by blanketing the surface and impeding the penetration of light. Such blanketing can also prevent gas exchange (sometimes leading to anaerobic conditions) which negatively affects aquatic plants and animals. It also competes with and displaces native plant life along river and creek banks and in wetlands.

7. ROUND 3: Explain to students that the alligator weed population has exploded. As a result, the surface of the ecosystem has become completely covered by the plant which has greatly reduced the amount of sunlight that penetrates to the native plants at the bottom of the water. These native plants cannot photosynthesize which causes them to die off and therefore affect the food supply and habitat of herbivores. Remove half of the food chips and half of the oxygen chips.
    - Before starting the round have students predict and discuss what will happen to the remaining native species in the game.

8. If there is time, keep playing rounds until all of the resources are depleted or start over and try the simulation again so that students who were eliminated in earlier rounds have a chance to play again.
9. Return back to the classroom and graph the results of the three rounds (or more rounds). Ask students if their predictions were correct after alligator weed populations proliferated?
    - Ask students to describe why native species' populations declined so sharply?
    - Can you think of other ecosystems and native species where something similar could happen?
    - What can humans do to help against invasive species? (Prevention, eradication, etc.)

Learning Targets:

1. Explain how plants or animals that are introduced to an ecosystem may become invasive and negatively affect the interrelationships between native plant and animal species.
2. Analyze the data collected and draw conclusions from population dynamics.