# ECOSYSTEM

#### **Activity: Ecosystem Simulation Game**

**Objective:** To understand the dynamics of an ecosystem, including interactions between organisms and the flow of energy and matter, through a hands-on simulation game.

## Materials:

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- 1. Index cards or slips of paper (at least 10 per student)
- 2. Writing materials (pens, pencils)
- 3. Large open space (such as a classroom or outdoor area)

#### **Procedure:**

#### Introduction:

- 1. Begin by discussing the concept of an ecosystem and its components, including living organisms (plants, animals, microorganisms) and non-living factors (air, water, soil, sunlight).
- 2. Explain that the activity will involve simulating an ecosystem to understand the interdependence and interactions between different species within it.

# **Ecosystem Role Assignment:**

1. Assign each student a specific role within the ecosystem. Roles can include producers (plants), consumers (herbivores, carnivores, omnivores), decomposers (bacteria, fungi), and abiotic factors (sunlight, water, air).

2. Provide each student with index cards or slips of paper representing their assigned role.

## **Ecosystem Setup:**

- 1. Create a designated area as the "ecosystem" in the classroom or outdoor space.
- 2. Instruct the students to disperse within the ecosystem area, positioning themselves according to their assigned roles.

#### **Ecosystem Interactions:**

- 1. Explain the rules of the game: Each participant must interact with other participants according to their assigned role and the natural interactions that occur in an ecosystem.
- Encourage students to engage in activities such as: a. Producers (plants) using sunlight, water, and nutrients to grow. b. Herbivores consuming plants. c. Carnivores preying on herbivores. d. Omnivores consuming both plants and animals. e. Decomposers breaking down dead organisms and recycling nutrients back into the ecosystem.

#### **Energy and Matter Flow:**

- 1. Instruct the students to exchange energy and matter through interactions within the ecosystem.
- 2. Encourage them to demonstrate the transfer of energy and nutrients by physically passing or exchanging their index cards or slips of paper.
- 3. Emphasize the importance of maintaining a balanced ecosystem, where energy and matter flow efficiently between the different roles.

#### **Ecosystem Stability and Disruption:**

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- 1. Introduce disruptions to the ecosystem to simulate natural challenges or human impacts, such as habitat destruction, pollution, or disease outbreaks.
- 2. Instruct the students to adjust their interactions and roles within the ecosystem to respond to the disruptions.
- 3. Discuss the consequences of the disruptions and the potential impact on the overall ecosystem stability.

# **Group Reflection and Discussion:**

- 1. Gather the students together for a group reflection and discussion.
- 2. Ask students to share their observations, challenges faced during the simulation, and any insights gained about ecosystem dynamics.

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3. Lead a discussion about the importance of biodiversity, the balance of trophic levels, and the role of humans in maintaining healthy ecosystems.

#### **Conclusion:**

- 1. Summarize the main concepts covered in the activity, including interdependence, energy flow, and the impact of disruptions on ecosystems.
- 2. Discuss the importance of preserving and protecting ecosystems for the well-being of all organisms, including humans.
- 3. Encourage students to explore further studies and careers related to ecology, environmental science, or conservation.

#### Assessment:

- 1. Active participation in the ecosystem simulation, including following assigned roles and engaging in interactions with other participants.
- 2. Contribution to the group reflection and discussion, showcasing understanding of ecosystem dynamics and thoughtful insights.
- 3. Written reflection or response on the importance of ecosystem preservation and personal commitments to environmental conservation.

