**Title of the Lesson: Exploring Ecosystems**

**Duration of the Lesson**: 3 days (60 minutes per day)

**Curricular Area/Topic included in the Lesson**: Science - Ecosystems

**Goal/s and Behavioral Objective/s for the Lesson: Exploring Ecosystems**

* **Goal:** Students will understand the components and interactions within an ecosystem.
* **Behavioral Objective:** By the end of the lesson, students will be able to identify and explain the relationships between organisms, abiotic factors, and the environment within an ecosystem.

**Standards/Benchmarks addressed in the Lesson:**

* Next Generation Science Standards (NGSS):
  + LS2.A: Interdependent Relationships in Ecosystems
  + LS2.B: Cycle of Matter and Energy Transfer in Ecosystems

**Essential Question/s:**

1. What are the different components of an ecosystem?
2. How do living organisms and the environment interact within an ecosystem?
3. How is energy transferred and matter cycled within an ecosystem?

Activities/Procedures for the Lesson:

**Day 1 of Exploring Ecosystems :**

1. Opening (10 minutes)
   * Engage students by asking them to share their experiences with nature and any observations they have made about the environment.
   * Discuss the importance of studying ecosystems and their relevance to our daily lives.
2. Introduction to Ecosystems (15 minutes)
   * Present a multimedia presentation or video that introduces the concept of ecosystems.
   * Define critical terms such as organisms, abiotic factors, and environment.
3. Exploring Components of Ecosystems (20 minutes)
   * Provide students virtual access to ecosystems (e.g., rainforest, desert, ocean) through interactive websites or virtual tours.
   * In small groups, students explore and identify the living organisms, abiotic factors, and environmental characteristics specific to each ecosystem.
   * Facilitate a class discussion to compare and contrast the different ecosystems.

**Day 2 of Exploring Ecosystems:**

1. Review and Recap (10 minutes)
   * Begin the lesson by reviewing the components of ecosystems discussed in the previous class.
   * Ask students to recall the interactions between living organisms, abiotic factors, and the environment.
2. Interactions within Ecosystems (20 minutes)
   * Present a slideshow or video on ecosystem interactions, including predation, competition, and symbiotic relationships (mutualism, commensalism, parasitism).
   * Engage students in a virtual game or simulation where they can explore and identify examples of these interactions within different ecosystems.
3. Virtual Field Trip (25 minutes)
   * Take students on a virtual field trip to a local ecosystem (e.g., a park, wetland, or forest).
   * Provide guided questions and prompts for students to observe and reflect on the interactions they witness during the virtual field trip.
   * Encourage students to take notes or capture screenshots to support their reflections.

**Day 3 of Exploring Ecosystems:**

1. Reflection and Discussion (10 minutes)
   * Begin the lesson by asking students to share their reflections from the virtual field trip.
   * Facilitate a class discussion to identify and discuss the observed interactions and their importance within the ecosystem.
2. Energy Flow and Matter Cycling (20 minutes)
   * Introduce the concepts of energy flow and matter cycling within ecosystems.
   * Use diagrams, animations, or virtual models to illustrate these processes.
   * Discuss the roles of producers, consumers, and decomposers in energy transfer and the cycling of nutrients within ecosystems.
3. Culminating Activity: Ecosystem Diagram (25 minutes)
   * In small groups, students create virtual ecosystem diagrams using digital tools (e.g., Google Slides, Lucidchart).
   * Each group should depict the components of an ecosystem, the interactions between them, and the flow of energy and cycling of matter.
   * Students present their diagrams to the class, explaining their choices and connections.

Methods of Differentiation:

* Provide additional resources or readings for advanced learners to explore further.
* Offer graphic organizers or templates for students who may require extra support in organizing their thoughts.
* Assign roles within small groups to ensure active participation and collaboration.

**Materials and Equipment when Exploring Ecosystems:**



* Multimedia presentation/video
* Interactive websites/virtual tours
* Slideshow/video on ecosystem interactions
* Virtual game/simulation
* Virtual field trip resources
* Digital tools for creating ecosystem diagrams
* Internet access and devices for students

**Assessment Plan when Exploring Ecosystems:**

* Formative Assessment: Monitor student participation and engagement during class discussions, virtual activities, and the virtual field trip. Observe their ability to identify components and interactions within ecosystems.
* Summative Assessment: Evaluate the ecosystem diagrams created by the student groups based on the accuracy and clarity of their representations of components, interactions, and energy/matter flow.

**Reflections on Learning Activities:**

* As a reflection, ask students to respond to the following prompts:
  1. Describe one new thing you learned about ecosystems and their significance.
  2. How did the virtual field trip enhance your understanding of ecosystem interactions?
  3. Explain the importance of energy flow and matter cycling within an ecosystem.

https://youtu.be/5TjOJ5f3AwU

**References:**

Goldberg, S. and National Geographic Partners (U.S (2019). *Women : the National Geographic image collection*. Washington, D.C.: National Geographic.

US EPA, O. (2015). *EnviroAtlas Eco-Health Relationship Browser*. [online] www.epa.gov. Available at:<https://www.epa.gov/enviroatlas/enviroatlas-eco-health-relationship-browser>

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