Bio-Explorers: Decoding Living Complexity

Learning Objectives

- Understand the fundamental concepts of biodiversity
- Develop skills in ecological observation and data collection
- Learn to identify relationships between different species
- Explore human impact on local ecosystems

Initial Exploration (15 minutes)

Look around your immediate environment and complete the following biodiversity survey:

Living Thing	Where Found	Characteristics	Interactions

Biodiversity Vocabulary Builder (20 minutes)

Match each term with its correct definition and provide an example:

Terms to Match: Ecosystem, Species, Habitat, Food Web, Population

Term	Definition	Your Example
1.		

2.		

Ecosystem Investigation (30 minutes)

Choose a small area in your school grounds and create a detailed ecosystem map:

1. Draw your ecosystem in the space below, including:
    - Plants and their locations
    - Animal evidence (tracks, nests, etc.)
    - Abiotic factors (sunlight, water, soil)
    - Human influences

[Drawing Space]

Analysis Questions:

1. What are the main producers in your ecosystem?

2. Identify three possible food chains in your ecosystem:

3. How might this ecosystem change across seasons?

Biodiversity Data Collection

Record biodiversity data using this scientific format:

Species Type	Count	Behavior	Habitat Features

Human Impact Analysis (45 minutes)

Investigate how human activities affect local biodiversity:

Human Activity	Positive Effects	Negative Effects	Possible Solutions
Urban Development			
Agriculture			
Recreation			

Local Ecosystem Case Study

Read the following case study about your local ecosystem and answer the questions:

The Urban Park Ecosystem

Your local park represents a unique ecosystem where natural processes interact with human influence. Despite being surrounded by urban development, it maintains a delicate balance of native and introduced species...

Recent surveys have shown that the park supports over 50 bird species, 20 different types of insects, and numerous plant species. However, the ecosystem faces challenges from pollution, invasive species, and human activity.

1. What evidence suggests this is a healthy ecosystem?

   _____

2. Identify three main threats to this ecosystem:

   _____

3. Propose a conservation strategy:

   _____

Food Web Construction (30 minutes)

Create a detailed food web using the organisms observed in your ecosystem:

Common Organisms:

- Producers: grass, trees, flowering plants
- Primary Consumers: insects, small birds
- Secondary Consumers: larger birds, small mammals
- Decomposers: bacteria, fungi

[Food Web Drawing Space]

Food Web Analysis:

1. Identify three different food chains within your web:

   _____

2. What would happen if one species was removed?

   _____

3. How do seasonal changes affect this food web?

Adaptation Investigation (40 minutes)

Study how different organisms have adapted to your local environment:

Organism	Physical Adaptations	Behavioral Adaptations	Survival Advantage

Mini Research Project

Question: How does human activity affect biodiversity in different areas of the school grounds?

Materials needed:

- Quadrat (1m x 1m)
- Magnifying glass
- Data collection sheets
- Camera (optional)

Method:

1. Select three different locations with varying levels of human activity
2. Place quadrat and count species within
3. Record environmental conditions
4. Compare biodiversity levels

Conservation Action Plan

Design a conservation plan for your school ecosystem:

Current Status Assessment

Area	Current Condition	Threats	Priority Level

Proposed Actions:

1. Short-term actions (1-3 months):

2. Medium-term actions (3-6 months):

3. Long-term actions (6-12 months):

Reflection and Conclusions

What We've Learned

Key Discoveries:

1. The main components of our local ecosystem are:

2. The most surprising thing I discovered was:

3. One way we could protect this ecosystem is:

Extension Activities

- Create a photo journal of your ecosystem over one month
- Design a conservation plan for your study area
- Research the history of your ecosystem's changes