Experiment M-3
Ecology Research Project

Objectives

- To learn about the ecological principles of biotic and abiotic factors.
- To explore an ecosystem.
- To measure abiotic factors with the Panda (light, dew point, relative humidity,), observe the biotic factors (plants, fungus and animals) and find the connection between them.

Modules and Sensors

- PANDA-1 Panda Multi-sensor

Introduction

An ecosystem is defined as any community of living and non-living things that work together. They do not have clear boundaries, and it can be difficult to see where one ecosystem ends and another begins. The biotic and abiotic factors within the ecosystem are what make it unique.

Biotic factors are all of the living organisms within an ecosystem. These may be plants, animals, fungi, and microorganisms. Abiotic factors are all of the non-living things in an ecosystem.

Biotic and abiotic factors are related to each other in an ecosystem. Abiotic factors are very important because they directly affect how organisms survive.

Abiotic factors can vary among different ecosystems. Examples of abiotic variables are rain, wind, temperature, altitude, soil, pollution, nutrients, pH, types of soil, and sunlight.

In this activity, you will explore two ecosystems, measure the abiotic factors with the Panda multi-sensor and observe and count organisms in those environments.

Procedure

Experiment setup

1. Decide with your teacher on an environment to explore and what are the dates and times of day you will measure in.
    It can be throughout a day, a week, a month or different seasons.

2. Arrive at the destination.

3. Decide on the surface area you are going to explore (for example, 2 square meters).

Settings

4. Press on the **Sound sensor** icon 🔊 on the top left of the screen.

5. Use the arrows ⌃ ⌄ to select a different sensor.

6. Continue in this way to change the internal sensor you want to use.

Testing and measurements

NeuLog Panda

7. Fill out these tables:

Ecosystem name: _____

Date: _____

Time of day: _____

Abiotic factors	Result
Light	
Temperature	
Relative humidity	
Dew point	

Biotic factors/name of the organism	Number of organisms in the chosen area	Location of these organisms (for example: on the ground, air, on a plant, distant from a plant etc.)

8.   Arrive at your destination at a different time and fill out the tables again (this can be done many times).

Ecosystem name: _____

Date: _____

Time of day: _____

Abiotic factors	Result
Light	
Temperature	
Relative humidity	
Dew point	

Biotic factors/name of the organism	Number of organisms in the chosen area	Location of these organisms (for example: on the ground, air, on a plant, distant from a plant etc.)

Summary questions

1.   How did each of the abiotic factors change during the day/week/month/year?

2.   How did the biotic factors change during the day/week/month/year?

3.   Find a link between at least one of the abiotic factors to one of the organisms you observed (or not observed in different times). Explain how the factor affected the organism.

For example:

We followed the activity of ants throughout the month. It is clear that they were most active during the second part of the month while temperature was rising.

When air temperature drops in the beginning of winter the ant's body temperature drops as well, so much that they become sluggish and therefore hibernate under the soil. When the winter ends they become active again.