Organism Interactions in Ecosystems
Interdependent Relationships in Ecosystems

Do

Finding Biotic and Abiotic Factors in the Schoolyard

Scientific Investigation
Do you live in a desert, grassland, or forest? The answer to that question will determine what type of living and nonliving factors surround you. Living factors are called biotic, and include plants and animals. The nonliving factors of an ecosystem are just as critical. They are called abiotic. Abiotic factors are things like the air, temperature, water supply, and type of soil.

Procedure:
Plan an investigation to observe biotic and abiotic factors of an ecosystem. In your lab journal, address the following investigation,

Step 1: Question.
Step 2: Relevance.
Step 3: Variables, if applicable.
   Independent variable (also known as the manipulated variable)
   Dependent variable (also known as the responding variable)
   Control variable(s) or group, also known as constants
Step 4: Hypothesis.
   Is a hypothesis needed? If so, what is it?
   How will the responding variable change when the manipulated variable changes?
Step 5: Materials.
Step 6: Safety considerations.
Step 7: Procedure.

Sample Procedure
1. As a group, find a teacher-approved area to observe. Identify the biotic and abiotic factors in the assigned area.
2. Identify one biotic factor in the ecosystem. Draw it and describe the niche of the organism in your lab journal. Take a picture of the organism.
3. Count the number of the chosen organism as accurately as possible. Draw a population of the organism and describe the characteristics of the population in your lab journal.
4. Identify other living organisms in your ecosystem. Think about how they interact with each other. Draw a picture or take a photograph of any activity or interactions observed.
5. Identify abiotic factors within the assigned ecosystem. Record any data collected in your lab journal. This can include the temperature, soil pH, and the presence of water.
6. Describe the interactions of the different populations with each other for biotic factors and the interactions with the abiotic aspects of the ecosystem. Draw a picture of the ecosystem in your lab journal.
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Scientific Investigation, continued

Step 8: Data Collection:
Create data tables similar to the example table below in your lab journal and fill in during your investigation.

<table>
<thead>
<tr>
<th>Biotic Factors</th>
<th>Description</th>
<th>Number/Abundance</th>
<th>Noted Interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abiotic Factors</td>
<td>Description</td>
<td>Number/Abundance</td>
<td>Noted Interactions</td>
</tr>
</tbody>
</table>

Step 9: Data Analysis:
Create a graph based upon the data, if needed. Make a general statement about your results.

Step 10: Conclusion and scientific explanation:
Write a scientific explanation on how abiotic and biotic factors interact.
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## Rubric for writing a scientific explanation

<table>
<thead>
<tr>
<th>Points Awarded</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Claim</strong></td>
<td>Not applicable.</td>
<td>Answers the question and is accurate based on data.</td>
<td>No claim or does not answer the question.</td>
</tr>
<tr>
<td><strong>Evidence</strong></td>
<td>Cites data and patterns within the data. Uses labels accurately.</td>
<td>Cites data from the data source, but not within the context of the prompt.</td>
<td>No evidence, or cites changes, but does not use data from data source.</td>
</tr>
<tr>
<td><strong>Reasoning</strong></td>
<td>Cites the scientifically accurate reason using correct vocabulary and connects this to the claim. Shows accurate understanding of the concept.</td>
<td>Cites a reason, but it is inaccurate or does not support the claim. Reasoning does not use scientific terminology or uses it inaccurately.</td>
<td>No reasoning or restates the claim, but offers no reasoning.</td>
</tr>
<tr>
<td><strong>Rebuttal</strong></td>
<td>Rebuttal provides reasons for different data or outliers in the data. Can also provide relevance to the real world or other uses for the findings.</td>
<td>Rebuttal is not connected to the data or is not accurate.</td>
<td>Does not offer a rebuttal.</td>
</tr>
</tbody>
</table>