

# Investigation 3.D: An Ecosystem Field Study

**Question:** How can you determine, qualitatively and quantitatively, the interrelationships between the abiotic and biotic components of ecosystems?

## Safety Precautions



- Wear gloves if you are handling soil or water samples.
- Wash your hands thoroughly after your field study.
- Minimize your impact on organisms and their habitat as much as possible. Collect representative sample specimens of plants and animals only if absolutely necessary for identification. Use sketches or digital photos, if possible.
- If you disturb a habitat (by digging a hole, for example), return the habitat as close as possible to its original condition.

## Materials

- tent pegs
- string
- Hula Hoops™ (optional)
- selected tools and materials approved by your teacher
- field guides

## Experimental Plan

1. With your group, and using the suggested materials as a starting point, develop a plan for investigating the two study sites you chose in Thought Lab 3.1. Half of your group should study one site, and the other half should study the second site. You want to be able to compare the diversity of life in the two sites. Use the string and tent pegs (or Hula Hoops™) for transects or quadrats. In your study, you must:
  - include information about the abiotic features of your study site
  - determine the two or three dominant plant(s) of your study site
  - provide an overview of the species present in your study site, including an estimation of the number of species and their populations. (If necessary, in order to identify the species of each organism, plan to draw a sketch or take a photo of Plant 1, Plant 2, Animal 1, Animal 2, and so on, and use library or Internet resources to identify them when you come back from the field.)
  - use classification systems and naming systems
  - take a sample (or samples) to estimate the populations of the organisms in your study site
2. Develop a data table that you will use to collect data at your study site.
3. Develop a plan to ensure the safety of your group as well as the safety of the organisms in your study area.
4. Have your plan approved by your teacher.

## Data and Observations

Conduct your field study and record your results.

## Investigation 3.D: An Ecosystem Field Study (cont'd)

### Analysis

1. Prepare a report detailing the abiotic and biotic components of your ecosystem. Include the following information:
  - location and size of your study area
  - the history of the area (for example, how long it has remained undisturbed or how recently it was developed)
  - the methods and tools you used in your field study
  - the abiotic components of your study area, including both qualitative and quantitative observations
  - the biotic components of your study area, including plant and animal species (common and scientific names) and, for at least two species, a description of their ecological niche in this ecosystem

### Conclusions

2. Why was it important to choose sample areas randomly?
3. Why was it important to sample more than one area in your field study?
4. What are some limiting factors that might affect species in your study site?

CHAPTER 3	Investigation 3.D: An Ecosystem Field Study (cont'd)	BLM 3.3.7
HANDOUT		

5. a) Write a description comparing the diversity and abundance of species in the two study sites.

b) Describe how the ecosystems of the two study sites are similar.

c) Describe how they are different.

6. How have humans changed either of the ecosystems of the sites you studied?

CHAPTER 3	Investigation 3.D: An Ecosystem Field Study (cont'd)	BLM 3.3.7
HANDOUT		

7. Describe the tools and materials your team chose in terms of usefulness, accuracy, and reliability.

8. What are some ways you could improve your investigation techniques in future field studies?