

*Exploring the Outdoor Environment: A Field Study Around Your School***Table of Contents**

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Activity B

Exploring the Outdoor Environment: A Field Study Around Your School

Overview

In this activity students will practice collecting data as field biologists. They will perform assessments of actual sites within an environmental setting near your school. The aim is for students to observe, collect and compare abiotic and biotic environmental components.

During the previous activity (Topic 1, Activity A) students explored the concepts of biotic and abiotic factors. In this activity they will study these factors in an actual field environment. By characterizing an actual field environment the students will begin to understand how the different factors within the environment are interrelated.

Learning Objectives

- ✓ Identify at least FIVE different characteristics representative of various environments
- ✓ Collect initial data characterizing TWO specific environments
- ✓ Compare factors characterizing TWO specific environments
- ✓ Identify abiotic and biotic factors in an environment
- ✓ Classify a variety of factors as abiotic or biotic

Relevance

We live in a world that is made up of many different objects, factors and conditions. Many, we depend on and interact with to live our daily lives. So it is not unusual that several present-day problems and their solutions in some way concern our local surroundings. Just consider a few decisions that you or elected officials may make in the future. What kind of car to drive? What refrigerator to buy? Do we need to build power plants? How good is our sanitation and waste management? Before we can make informed decisions, it is necessary to begin to understand the complex conditions and interactions that exist in our local environment. With this greater understanding, we can begin to understand the characteristics of a stable ecosystem. This kind of perspective can also help us make assessments about the costs and benefits of different alternatives that can impact the quality of our air and water and the general health of our population.

Teacher Preparations

- a) Gather the materials listed below. A table with suggested uses for certain materials is included. Be flexible in the use of these materials. Allow students to suggest their own uses, or to come up with the ones we have suggested.
- b) Select sites near you school that would be appropriate to study. While we have designed the activity for students to propose the areas to study it is important that you have already thought through the areas that would be most appropriate for the class to study. While you want to study areas that represent the diverse areas around your school, some areas may be inappropriate or off limits.
- c) Get appropriate permission. Make sure both school administrators and parents have provided permission. If it is school policy to have parents sign permission slips, be sure that you have done so well in advance of the activity.
- d) Work through the activity yourself in depth before having students try the activity themselves.

Materials

Zip-lock bag of measuring ‘tools’ (including a straw, protractor, string, water, matches, marking tape, candle, marble, graph paper and ruler), post-it notes, strips of paper.

TOOL	POSSIBLE USES
Straw, Protractor and String	Topographical slope
	Tree Heights
Water	Soil porosity
Matches and Candle	Wind Direction
	Wind Speed
Marble and Ruler	Topographical Slope
Marking Tape	Site Identification
	Tree Labeling
Graph Paper	Site Mapping
	Tree Height Calculations

Period 1 – Seek and You Shall Find

Engagement – Preliminary activity

What's around our school? The teacher asks the class the following question: What are the different environmental areas that surround the school? The students write the names of the different areas on pieces of paper. Allow students THREE minutes to complete their lists. Have students share their lists with the classmate sitting next to them. Have each student write down how their list differs from their classmate. After comparing lists, have the pairs of students make one master list that both students can agree on having all of the different environmental areas around the school listed.

Methods

1. Create a master list of all the environmental areas around the school
 - a) Have each pair of students present their list of areas outside the school. This can be done with the students seated at their desks.
 - b) As students describe their areas, the teacher (or another student) writes the areas on the board. If different groups repeat an area, place a check mark next to the listing, but do not rewrite the area.
 - c) Discuss the master list with the class after each group has presented their list.
 - d) Make any modifications to the list that the class or teacher thinks is appropriate. This may include modifications due to inaccessibility.
 - e) It would be helpful if there were an even number of sites so that contrasting sites can be paired.
2. Create area pairs
 - a) Have students suggest pairs of areas that they think have contrasting characteristics.
 - b) As the different students suggest the pairs, connect the areas with different colored lines.
 - c) The pairs may need to be modified to incorporate all the different areas to be studied. Stress to the students that there is more than ONE correct way to pair the different areas. This is merely a way to have different groups study different sites around the school.
3. Create small student groups
 - a) The number of students per group will depend on the number of sites and the number of students you have in the class. Groups of at least THREE may be helpful.
 - b) Within a group of THREE, students can be assigned the roles of data organizer, materials organizer, and data collector. Roles such as timekeeper, task manager, as well as others you think appropriate can be added for larger groups.
 - c) Assign the paired sites to each group.
 - d) Provide students with the materials/tools that they may find helpful in collecting the data.

- e) Have students within their groups discuss the potential uses for the tools provided.
4. Site data collection
 - a) Have students use their Data Sheet 1 from Activity A as a guide to this activity. The students should collect data on the conditions that they compiled on that worksheet.
 - b) As the students collect their data have them address each of the Investigation Questions in their activity guide methods section: Conducting the School Field Study.
 5. Complete Summary Investigation Questions
 - a) As students arrive back in the classroom have them review their responses to the Investigation Questions and complete the Summary Investigation Questions.
 6. Conclusion – Brief Discussion
 - a) Discuss with students the types of conditions that they found at their sites.
 - b) Were there any surprises that they found about the characteristics at their sites? What were they?
 - c) What difficulties did they encounter collecting their data?

Period 2 – Mind Mapping

In this activity students organize and classify the different types of data that they collected during the previous period.

Engagement – Preliminary activity

What’s a mind map? Students construct a demonstration mind map made up of familiar terms.

Cat Dog Fish Water Land Scales Fur

1. Students select two of the above listed words that they think are connected in any way. Have them write down the two words with a line between them. It would be helpful to demonstrate this on the board as well.
2. Instruct them to write a phrase on the line between the two words describing the concept that demonstrates/explains the relationship between the two words.
3. They continue constructing their mind maps using all the words. Each word can be connected to more than one word.
4. Be sure to emphasize that there are many ways that these words can be connected and therefore there are many different mind maps that are correct.
5. Students demonstrate their mind maps to the class.

Methods: Environmental Area Mind Mapping

Students will construct mind maps for the different factors identified in their Seek and You Shall Find activity where they conducted a Local School Field Study.

1. Provide students with a stack of post-it notes or index cards and strips of paper.
2. Students write out all of the factors that you have identified from the different sites around your school onto individual post-its or index cards, adding any additional factors.
 - a) This can be done as individual group work, with each of the different groups making mind maps from their individual group work.
 - b) This may also be done by first making a class list of the factors important for each group to characterize their environments. If you will be using a class list of factors, be sure to review the answers to the Summary Investigation Questions completed at the end of the previous class period.
3. Students use the paper strips to connect the factors that have some kind of relationship.
4. The relationship between each word can be written on the paper strips connecting the two terms. This may be difficult for students to do depending on their familiarity with mind mapping. Even if they have not written the connecting phrase out it is important that each group member is able to state the connection clearly.
5. Go to each group as they are finishing their mind-maps. Once they have demonstrated their connections and you find it to be satisfactory, provide each group with materials to reconstruct the mind map using the poster board. This can be a more permanent construction. (If time is limited, this permanent construction can be omitted)
6. Students answer the questions on the Individual Assessment Sheet using the ideas about environmental conditions from their work.