

*A Walk Through the Forest***Table of Contents**

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Activity E

A Walk Through the Forest

Overview

We have begun to learn how the abiotic and biotic factors in a small area interact with one another and help create an ecosystem. On an even larger scale, this is also the case. As the abiotic factors of an area change, due to topographic (elevation or altitude), latitudinal (location on Earth) or geographic (close to mountains, ocean, etc.) considerations, the biotic communities will also change. These differences can be seen easily in individual animals found around the planet. Just consider the large variety of characteristics that enable different animals to cope with the abiotic and biotic conditions that make up their environment.

Today, your class will be taking a hike through an ecosystem known as the Black Rock Forest in New York State. This is the next site to continue your field studies to determine how abiotic and biotic factors interrelate. Bring your walking shoes because this is about a 2-mile hike! If you can't physically travel to the Black Rock Forest, you have the opportunity to take a virtual walk through the Forest. For the virtual walk, visit the web site: <http://icp.giss.nasa.gov/education/modules/carbon/>, look under Topic 1, Activity E, *Data and Tools*.

On the real life or virtual walk, your group will concentrate on one of four themes. The four themes are: 1) Geology and Soils, 2) Plant life, 3) Wildlife and 4) Human Impacts. As you are 'walking' keep your eyes open for clues about the many interactions between different aspects of the Black Rock Forest ecosystem. Once you finish your 'walk', prepare a PowerPoint presentation to educate all the other groups about your theme. Remember, "Take only photos, leave only footprints," and enjoy exploring the deciduous forest ecosystem.

Learning Objectives

- ✓ To identify a variety of characteristics that are representative of various habitats
- ✓ To collect data characterizing various habitats
- ✓ To review abiotic and biotic factors in a variety of habitats within a temperate deciduous forest ecosystem
- ✓ To experience/identify a number of diverse habitats within a temperate deciduous forest ecosystem

Relevance

Forests are complex, constantly changing environments made up of living and non-living things. They are an excellent place to study and learn about the interdependence of life. In the world's forests we can find many different kinds of habitats that support the broadest range of plant and animal life. We can study the processes or cycles that supports the forest ecosystem and in turn support us. For example in the forests many interconnected cycles are at work, including water, energy, and carbon, all keys to life on Earth.

Human and natural disturbances to the ecosystem conditions can alter such things as soil type, amount of sunlight, tree species, animal populations, water resources, all of which can potentially have positive and negative effects on individual habitats and even the entire ecosystem. Forest studies reveal the importance of forest management practices. Today, there is a growing interest in improving our understanding of how we are changing the land surface and how this is contributing to a global loss in forested areas. Some of the key areas being studied are the impacts of forest fires, logging practices, urban sprawl and climate change. Without knowledge of ecosystem interactions, humans may inadvertently alter Earth's ecosystems in such a way as to create negative environmental, economic and human health consequences. Therefore, it is essential to understand these ecosystem interactions to ensure that our daily survival needs can be met in the future.

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Materials

The materials you need for this activity depend on whether you are doing the real life hike or the virtual version on the Internet.

For the real life version you should be sure to dress for the weather. Have a backpack, plenty of water, and snacks. Also, a small first aid kit is an essential item. Depending on the time of year, have layers of clothing available for your use, so that you are prepared for the changes in temperature you will experience throughout the day and from one location to another on your hike. Be sure to wear comfortable walking shoes and carry all medication (inhalers, etc.) that you might need in your pack. You will also need a notepad and something to write with, your theme area's Hike Information Packet, a camera (digital works best for easy transfer of photos onto a computer), and any other data collection tools that may come in handy for your group. For example, the geology and soils team might want a thermometer, the plant life team might want some plastic Ziplock bags as well as some tree and plant life identification guides, wildlife team might want some animal or animal track identification guides.

For the virtual version, you will need a computer with Internet access, your notebook and something to write with. See <http://icp.giss.nasa.gov/education/modules/carbon/>. Look under Topic 1, Activity E, *Data and Tools*.

Methods

Preliminary Discussion and Planning

1. Read the Introduction to the Black Rock Forest Hike.
2. As a group, decide how your theme is different from that of other groups and list a number of these differences on **Data Sheet 1: Comparison of Theme Areas**.
3. As a group, decide how the physical environment can influence your theme and list these different ways on **Data Sheet 1**. Remember the major abiotic factors that can influence a Northeastern U.S. forest are temperature, precipitation, wind, elevation, light, the slope of the land and fires.

Observations

1. At each of the TEN stops, read the information for that stop.

2. Observe the area from the perspective of your theme in either real life, or through pictures provided. Consider how this habitat is different from the others. How are the physical characteristics similar? How are they different? Remember the major abiotic factors that can influence a Northeastern U.S. forest are temperature, precipitation, wind, elevation, light, the slope of the land and fires.
3. Reference or take pictures as evidence of your observations at each stop.
4. Record observations on **Data Sheet 2: Observations in Black Rock Forest.**

Data Analysis, Comparisons and Consensus

When finished with the hike discuss as a group the following questions.

1. How do the differences in the physical characteristics influence your theme topic? Think about the specific physical characteristics of the different hike stops as you focus on each habitat.
2. What were the major physical characteristics influencing your theme throughout the walk?
3. What were other characteristics (not physical) that influence your theme throughout the walk?
4. The deciduous forest ecosystem is made up of a variety of habitats. How does this diversity increase the stability of this ecosystem?
5. Each habitat is part of the deciduous forest ecosystem. Why group together such a diversity of habitats into one all encompassing system?

Group Assessment

To assess your understandings of your theme area as it relates to interactions in the forest ecosystem, create a presentation about what you learned. Highlight connections between the physical factors (abiotic) of each stop and your theme. A PowerPoint presentation will allow you to utilize the pictures you referenced or photos from your walk (use a minimum of two and maximum of 3 slides per stop). The last FIVE slides of your presentation should incorporate a discussion of the previous questions listed under the Data, Analysis, Comparisons and Consensus section.

As the other groups present their topics, take notes using the **Presentation Preparation Sheet** to help you keep all the information organized. Once Presentation Preparation Sheet is completed, summarize the information and answer the Individual Assessment Questions.

Comparison of Theme Areas

A. Once you finish reading through the Introduction to Black Rock Forest Hike, as a group decide how your theme is different from that of other themes and list a number of these differences below.

Your theme: _____

OTHER THEMES			
DIFFERENCES	-	-	-
	-	-	-
	-	-	-
	-	-	-
SIMILARITIES	-	-	-
	-	-	-
	-	-	-
	-	-	-

B. As a group, decide how the physical environment (abiotic factors) can influence your theme and list these in the table below. (Remember the major abiotic factors that influence a forest are temperature, precipitation, wind, elevation, light, the slope of the land and fires.)

PHYSICAL FACTOR	TEMPERATURE	PERCIPITATION	WIND	ELEVATION	LIGHT	SLOPE OF THE LAND	FIRES
INFLUENCE TO THEME							
ANOTHER INFLUENCE TO THEME							

Observations in Black Rock Forest

At each of the TEN stops, read the information for that stop. Observe the area from the perspective of your theme either in real life, or virtually with photographs. At each stop, observe how the theme you are concentrating on is different from and similar to the other stops. Remember the major abiotic factors that influence a Northeastern U.S. forest are temperature, precipitation, wind, elevation, light, the slope of the land and fires.

STOP NUMBER AND HABITAT	HOW ARE THEME CHARACTERISTICS DIFFERENT?	HOW ARE THEME CHARACTERISTICS SIMILAR?	PICTURE REFERENCE NUMBER
1) THE PIPELINE			
2) TRAIL ON NORTHERN SLOPE OF HONEY HILL			
3) HEMLOCK STAND			
4) ALECK MEADOW POND			
5) THE STREAM			
6) TRANSITION ROCK			
7) VERNAL POOL			
8) DECIDUOUS FOREST			
9) RIDGE-TOP			
10) BEAVER SWAMP			

Presentation Preparation Sheet

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Fill in the YOUR THEME column for your topic based on your PowerPoint presentation. As the other groups present their themes, take notes using the columns to help you keep all the information organized.

STOP # and HABITAT	YOUR THEME	1	2	3
1) THE PIPELINE				
2) TRAIL ON NORTHERN SLOPE OF HONEY HILL				
3) HEMLOCK STAND				
4) ALECK MEADOW POND				
5) THE STREAM				
6) TRANSITION ROCK				
7) VERNAL POOL				
8) DECIDUOUS FOREST				
9) RIDGE-TOP				
10) BEAVER SWAMP				

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Use your notes from the presentation table to answer the following questions.

1. Identify three physical (abiotic) characteristics that are representative of the –

a) Beaver Swamp (water) habitat

b) Hemlock Stand (coniferous) habitat

c) Deciduous Forest habitat

2. Identify three living (biotic) characteristics that are representative of the –

a) Ridge-Top (mountain) habitat

b) Aleck Meadow (fresh water) habitat

c) Deciduous Forest habitat

3. Explain how the abiotic factors in a habitat affect the biotic community. Use at least THREE examples from the hike to support your ideas.

4. Explain how the biotic community in a habitat affects the abiotic factors. Use at least THREE examples from the hike as evidence.

5. Now you have seen that abiotic and biotic factors in an ecosystem change with variations in geography and topography. These changes create a diverse mosaic of habitats within a single deciduous forest ecosystem at Black Rock Forest. Explain why this habitat diversity actually provides a more stable deciduous forest ecosystem in general (500 Word Essay).