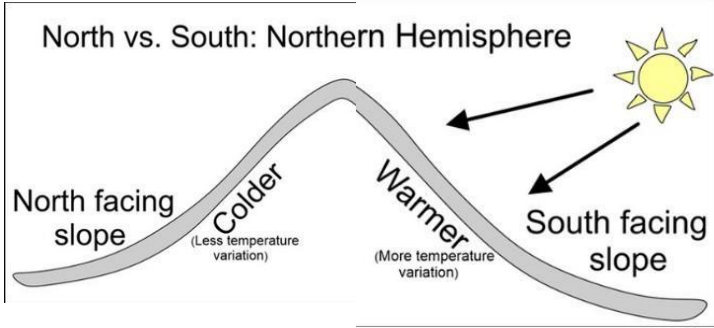


Microclimates of Wisconsin Data Collection Sheet	Name:	Group:
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**Background:**

**Microclimate** is the **climate of a very small area that differs from the surrounding climate.**

It is a measure of the temperature, humidity, and wind within a few feet or meters of the ground. Microclimate is important because it helps determine what living things can best survive in a given habitat.



In our investigation today, we'll be taking data to examine the microclimate of two habitats and then examining what plants and animals live there to see if the two are related. Our data will help us answer the Essential Question below.

**Essential Question: "How does microclimate influence what living things are found in different habitats?"**

You will work in a team of four members. Each member has an important job:

- # 1 - **Data recorder:** keeper of the data sheet/clipboard/writing utensil + infrared thermometer
- #2 – **Wildlife biologist:** observes and reports animal signs (burrows, nests, tracks, chew marks, scat, calls/songs, live animal sightings, etc) + thermal camera
- # 3 - **Climate scientist:** keeper of the Kestrel (measures and reports air temperature, wind speed, humidity)
- # 4 – **Forester:** measures and reports % canopy cover (densiometer) + identify trees with identification guide

**Beginning:** Identify specific causes and related effects.

1. <u>In your own words</u> , define the term microclimate.
Microclimate:

2. <b>List</b> factors that may impact the microclimate of natural areas.
1. _____ 3. _____
2. _____ 4. _____

**Materials:**

- \* Data sheet/clipboard/writing utensil
- \* Densiometer
- \* Kestrel Pocket Meter
- \*Thermal camera
- \*Tree Identification guide
- \* Infrared thermometer

### **Procedure:**

Each group member is responsible for reporting to the **Data Recorder** their findings. The **Data Recorder** is also responsible for working with the **Wildlife Biologist** to find the areas of maximum and minimum surface temperatures and recording on the data sheet.

#1 - **Data recorder:** write all data provided by group members onto the data sheet.

The Infrared thermometer measures surface temperatures.

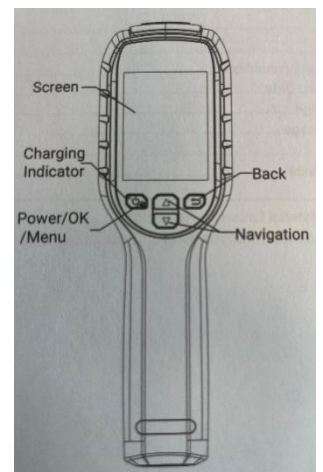
1. Turn the thermometer on by pressing the trigger
2. Turn OFF the laser pointer function by pressing the button with a light inside a triangle
3. Change units by pressing the deg C/deg F button
4. Turn on the screen light by pressing the light bulb button
5. **Record the surface temperature of 3 areas on the Data Sheet.**
6. **Work with the Wildlife Biologist to identify the maximum and minimum surface temperatures of the habitat and record on the Data Sheet.**



#2 - **Wildlife biologist:** within the area specified by your instructor, search for signs of animal activity (burrows, nests, tracks, chew marks, scat, calls/songs, live animal sightings, etc.) It is okay to not know for certain what made these signs, but you should make an educated guess based on what you see.

Using the thermal camera, locate areas of the greatest temperature difference within the area specified by your instructor and describe on the data sheet.

1. Turn the thermal camera on by pressing the red power button. Note the vertical color and temperature scale on the right side of the screen (blue shows colder, red shows hotter).
2. The Max and Min temperatures are on the top left in white.
3. The red & blue cross hairs show the hottest and coldest points in the view.
4. On the data sheet, draw or describe the area in the habitat with the greatest temperature difference.
5. **Report all evidence of animal activity observed to the Data Recorder.**



# 3 - **Climate scientist:** To determine the temperature, wind speed and humidity:

1. Turn the Kestrel pocket meter device on by pressing white circle button with a line through it.
2. Use the down arrow to scroll through wind speed, temperature and humidity. NOTE THE UNITS on the screen (mi/hr and deg F).
3. Hold the Kestrel towards the wind with the screen facing you. (If a plastic cover is over the impeller, open the plastic cover to allow air to pass through the impeller). You will see the impeller spin if the wind is blowing. **Report the wind speed number and units to the Data Recorder.**
4. Use the down (or right) arrow button to scroll to the temperature. **Report the temperature number and units to the Data Recorder.**
5. Use the down (or right) arrow to scroll past wind chill to humidity. **Report the % humidity to the Data Recorder.**
6. Repeat this procedure two more times for 3 locations total, each time **reporting results to the Data Recorder.**



#### #4 - Forester

1. How much canopy of trees overhead can be measured with a densiometer as a percentage.
  - ❖ If there are no trees overhead, that would be rated as 0% canopy cover.
  - ❖ If half of your view overhead is trees and half is sky, that would rate as 50% canopy cover.
  - ❖ If you can only see trees overhead and no sky, that would rate as 100% cover.
2. Hold the densiometer (toilet paper tube with cross hairs) up to the sky straight overhead. Estimate how much of your view of the sky is blocked by tree canopy by choosing a number between 0 and 100.
3. **Report the % canopy cover to the Data Recorder.**
4. Repeat this procedure two more times for 3 locations total, each time **reporting results to the Data Recorder.**
5. Using the tree identification guide, try to identify a few common trees. **Report the tree species to the Data Recorder.**










38%










50%

**Table 1: Habitat I**

Major Plant Species (from Forester + Instructor)	Temperature, Wind Speed, and Humidity (from Climate Scientist) Record UNITS!!!			% Canopy Cover (from Forester)	Animals Signs (from Wildlife Biologist)
	Air Temp 1:  <hr/> Surface Temp 1: <hr/>	Wind speed 1: 	Humidity 1: % 	% Canopy Cover 1: 	List and describe evidence of animal activity (burrows, nests, tracks, chew marks, scat, calls/songs, live animal sightings, etc.)  
 <p><b>Data Recorder:</b> Draw or describe the area in the habitat with the greatest temperature difference below.</p>	Air Temp 2: <hr/> Surface Temp 2: <hr/>	Wind speed 2: 	Humidity 2: 	% Canopy Cover 2: 	
	Air Temp 3: <hr/> Surface Temp 3: <hr/>	Wind speed 3: 	Humidity 3: 	% Canopy Cover 3: 	
	Average Air Temperature: <hr/> Average Surface Temp: <hr/>	Average Wind speed: 	Average Humidity: 	Average % Canopy Cover: 	
Maximum Surface Temp: _____  Minimum Surface Temp: _____					

**Table 2: Habitat II**

Major Plant Species (from Forester + Instructor)	Temperature, Wind Speed, and Humidity (from Climate Scientist) Record UNITS!!!			% Canopy Cover (from Forester)	Animals Signs (from Wildlife Biologist)
	Air Temp 1:  <hr/> Surface Temp 1: <hr/>	Wind speed 1: 	Humidity 1: % 	% Canopy Cover 1: 	List and describe evidence of animal activity (burrows, nests, tracks, chew marks, scat, calls/songs, live animal sightings, etc.)  
 <p><b>Data Recorder:</b> Draw or describe the area in the habitat with the greatest temperature difference below.</p> <p>Maximum Surface Temp: _____</p> <p>Minimum Surface Temp: _____</p>	Air Temp 2: <hr/> Surface Temp 2: <hr/>	Wind speed 2:	Humidity 2:	% Canopy Cover 2:	
	Air Temp 3: <hr/> Surface Temp 3: <hr/>	Wind speed 3:	Humidity 3:	% Canopy Cover 3:	
	Average Air Temperature: <hr/> Average Surface Temp: <hr/>	Average Wind speed:	Average Humidity:	Average % Canopy Cover:	

**Developing:** Explain specific causes and related effects.

3. Which habitat (I or II) had the highest average temperature? Which had the highest average % canopy cover?

4. Based on the data collected, what is the relationship between temperature and % canopy cover?

5. Which types of plants were more common in habitat I vs. habitat II? Were any plants found in both habitats?

**Proficient:** Interpret cause and effect relationships.

6. Using data/evidence from your investigation, describe how the different microclimate variables in each habitat influenced the types of plants and animals found living in that habitat.

Habitat I:

Habitat II:

**Advanced:** Propose causal relationships by examining what is known about smaller scale mechanisms within the system.

7. Using scientific vocabulary from the Background, data/evidence from your investigation, and discussion from the Conclusion, explain how predicted changes to the climate of Wisconsin may impact the plants and animals in the two habitats you investigated.

Habitat I:

Habitat II: