

27. Microclimates

Will some locations have a different temperature and humidity than the surrounding area?

Materials

- Mobile data collection system
- Notebook and pencil
- Weather sensor

Safety

Always follow your teacher's directions when doing any activity.

Investigation

After you complete a step or answer a question, place a check mark in the box (☐) next to that step.

When you see the symbol "◆" with a superscripted number following a step, refer to the numbered Tech Tips listed in the Tech Tips appendix that corresponds to your PASCO data collection system. There you will find detailed technical instructions for performing that step.

Get Started

1. In general, does this classroom have a "climate"?

2. Discuss with your classmates the measurable variables of climate for your classroom and record your conclusions.

3. What are the dependent and independent variables?

Microclimates

4. Make predictions about how the air temperature and humidity will vary in your classroom. List at least one place (or more) in the classroom that will have its own microclimate.

5. For any microclimate you have listed in your prediction, describe the physical feature that will cause it to vary in temperature and/or humidity.

Let's Explore

6. Obtain a mobile data collection system and start a new experiment. ♦^(1.2)
7. Connect a weather sensor ♦^(2.1) and monitor live data. ♦^(6.1)
8. Measure the temperature of the air at your desk. Record it in Table 1 below. Is this a microclimate? Explain.

9. In scientific terms, would the air temperature of the room be considered a variable or a controlled variable in this experiment? Explain.

10. Move to an area that you think you will find a microclimate in. Observe the air temperature and humidity. Record the location and the values in Table 1.

➤ Table 1: Classroom Microclimates

Location	Temperature (°C)	Relative Humidity (%)
The air in the classroom		
Under the plants in the terrarium		

11. In the space below, draw a picture of one microclimate from your investigation. Include the features that make it a microclimate. Label those features.

➤ Microclimate in the Classroom

Microclimates

Explain It

12. What was the difference in temperature and humidity between your microclimate and the classroom climate?

13. Were these big differences or small differences? What does this tell you about changes that can produce microclimates?

14. What physical features helped create changes in temperature or humidity?

15. You will be going outside to measure the air temperature in places that you think could be microclimates. Predict where you think you will find a microclimate around your school yard.

16. In your investigation of what controls temperature in a microclimate you learned some new scientific ideas and terms. It is important to be able to discuss your results using these words and terms correctly.

Write the meaning of the following terms in your own words using what you have learned from the activity.

Vocabulary and definitions

Climate	
Weather	
Microclimate	
Variable	
Control	

Tell Me More

In this section you will go outside and measure air temperatures of various microclimates.

17. Start a new experiment on your data collection system. $\diamond^{(1.2)}$ If it is not already connected, plug in a weather sensor. $\diamond^{(2.1)}$
18. Create a new display with temperature and humidity in a table. $\diamond^{(5.2.1)}$
19. Change the sampling option to manual sampling. $\diamond^{(6.3)}$
20. In Table 2 below, list the locations you think you will observe microclimates in. These will be your destinations.
21. Discuss with your partners what other factors you will observe at each location that will give you clues to the uniqueness of the microclimate. Physical features should be the first one. Fill in the top row of Table 2 below with these factors.
22. Follow your teacher's directions for travelling around your school grounds in search of microclimates.
23. When you arrive at your chosen location, record a set of manually sampled data. $\diamond^{(6.3)}$

24. Complete Table 2 below for recording your observations.

➤ Table 2: Sample Observations

Location	Physical Features and Organisms Present	Amount of Shade	Wind or Air Movement	Humidity	Temperature
Open space					

25. Save your experiment ^(11.1) and print your table from your data collection system ^(11.2) or transfer your data to the final columns of Table 2 above.

Sum It Up

In this part of the activity you will analyze your data and observations and draw conclusions about the factors that define a microclimate.

26. What happened to the temperature when the amount of moisture increased?

27. In what ways did the closeness of man-made structures such as walls affect the temperature and humidity?

28. Did the color of the ground or pavement have an effect on the temperature?

29. Did the color of the ground or pavement have an effect on the humidity?

30. Draw conclusions: What factors affect the temperature and humidity in a microclimate?

Assessment

Multiple Choice

Darken the circle of the best answer to each of the questions below. Be prepared to give the reasons for your choices.

1. Which statement below best describes a microclimate?
 - Ⓐ the temperature of the air
 - Ⓑ small area where the climate differs from the surrounding area
 - Ⓒ similar to an ecosystem
 - Ⓓ the weather in a given place

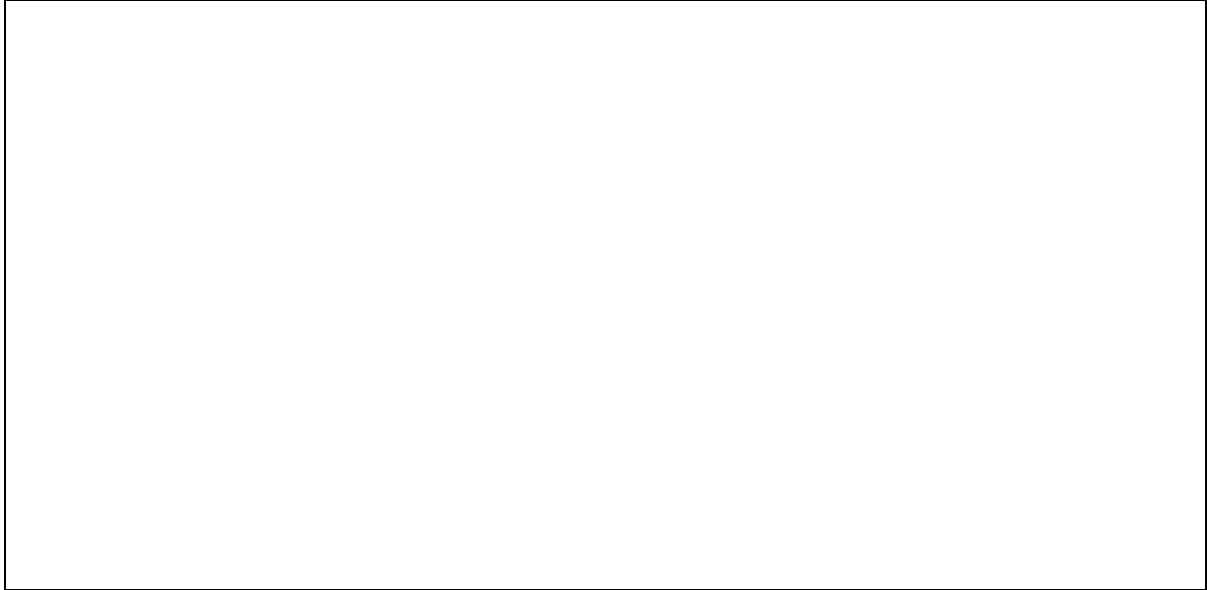
2. What variables can we use to determine microclimates?
 - Ⓐ temperature
 - Ⓑ humidity
 - Ⓒ barometric pressure
 - Ⓓ both A and B

3. In an experiment the _____ is the factor against which the changing dependent variable gets compared. It is like a standard.
 - Ⓐ temperature
 - Ⓑ wind speed
 - Ⓒ independent variable
 - Ⓓ control

Illustration

In the space below, draw a picture of an area exhibiting a microclimate and label the key parts. On the lines below your picture, explain what makes the scene a microclimate.

➤ Area of a Microclimate



Explanation:
