SNC1P

Activity 1.2: A Schoolyard Ecosystem   **Name: _____**

To gain a better understanding of the impact of environmental change on living things within ecosystems, you do not have to go far. You can begin by investigating your schoolyard, and how living things there respond to local biotic and abiotic factors.

Question

How do abiotic factors affect the distribution of weeds?

Prediction

Abiotic factors play an important role in determining which plants can succeed in an area. In this Investigation you will study sites on the north and west sides of your school building.

Which site do you predict will have the most weeds? _____

Explain your predictions _____

_____

_____

Design

This investigation is an exploration of how location affects the distribution of common weeds. You will measure abiotic factors on the north and west sides of the building, and you will observe and record the distribution of weeds on each side.

Materials

- Notebook
- Light meter
- Soil thermometer
- Anemometer (protractor, thread, ping-pong ball)

Procedure

1. Using the light meter, determine the amount of light at soil level in each location. Take three measurements at different locations within each site and record them in the table. Calculate the average for each site.

Light Readings

Measurement	North study site (lux)	East study site (lux)
1		
2		
3		
average		

2. Using a soil thermometer, measure soil temperatures at three different locations in each study site. Record your measurements in the table below.

Soil Temperature

Measurement	North study site (°C)	East study site (°C)
1		
2		
3		
average		

3. Point the thin edge of the anemometer into the wind. Measure the wind speed by reading the number of degrees from vertical the thread is at the edge of the protractor. Take three readings in each study site.

4. Use the following conversion table to convert the degrees to wind speeds. Record the wind speeds in the following table. Calculate the average for each site.

Conversion from Degrees to Wind Speed

Angle (°)	90	85	80	75	70	65	60	55	50	45	40	35	30	25
Wind speed (km/h)	0	9	13	16	19	21	24	26	29	32	35	38	42	46

Wind Speeds

Measurement	North study site (km/h)	East study site (km/h)
1		
2		
3		
average		

5. Count and record the number and type of weeds in each study site. Refer to a field guide to weeds to identify weeds you do not recognize. Record your data in the table below.

Incidence of Weeds in Study Sites

Type of Weed	Number of plants in north study site	Number of plants in west study site
Dandelion		
Plantain		
Crabgrass		

6. Sketch a map of each study area indicating the location of the weeds in each area.

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Analysis

1. Determine the total number of weeds in each study site.

2. Was your prediction correct? Explain why, or why not based on your observations.

3. Which abiotic factor do you think is most important for the growth of dandelions? Explain.

4. You may have noticed that there are more weeds close to the building than in the open field. How would wind help explain that difference?

5. From this investigation, can you tell whether light or soil temperature is more important in determining the number of weeds? Explain.

6. Explain why unfavorable growing conditions for grass could increase the number of weeds in a study site.

7. In which of the two study sites would you expect to find a larger animal population (non-plant population)? Explain your answer.

8. Do you think human activities affected the distribution of weeds in your study sites? If so, explain.

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A Schoolyard Ecosystem (Rubric)

Name: _____

Rating		Exceptional (Level 4)	Proficient (Level 3)	Satisfactory (Level 2)	Limited (Level 1)	Poor (Level R)
Categories	**Analyzing and Interpreting Data**	Provides rich analysis of the data	Provides sufficient analysis of the data	Provides some analysis of the data	Provides limited analysis of the data	Fails to provide analysis of the data.
		Draws insightful conclusions based on the data	Draws valid conclusions based on the data	Demonstrates some ability to draw conclusions based on the data	Demonstrates limited ability to draw conclusions based on the data	Fails to provide any conclusions based on the data.
	Communication of Ideas and Information	Communicates information and ideas clearly and precisely	Communicates information and ideas with substantial clarity and precision	Communicates information and ideas with some clarity and precision	Communicates information and ideas with limited clarity and precision	Fails to communicate ideas and information.
	Use of scientific terminology, symbols, conventions, and standard (SI) units	Uses scientific terminology, symbols, conventions, and standard (SI) units with few if any errors	Uses scientific terminology, symbols, conventions, and standard (SI) units with substantial accuracy	Uses scientific terminology, symbols, conventions, and standard (SI) units with some accuracy	Uses scientific terminology, symbols, conventions, and standard (SI) units with limited accuracy	Fails to use scientific terminology, symbols, conventions , and standard (SI) units

Note: Overall Rating:

☐ Student Excused: No Mark
☐ Unexcused Absence: rating 0
☐ Assignment not done or not submitted: rating 0