

Prairie Weather Detectives

Grade Level: 3rd-8th Grade

Objective:

- Students will understand how weather impacts the prairie ecosystem.
- Students will learn to interpret weather station data to identify patterns and correlations.

Materials:

- Weather station data (temperature, humidity, wind speed, precipitation) from the Plains Conservation Center (PCC)
- Weather journals or worksheets for recording observations
- Pictures or diagrams of prairie plants and animals
- Charts or graphs for displaying weather data
- Writing and drawing materials

Procedure:

Introduction (5 minutes):

1. Begin the lesson by briefly discussing the importance of weather in shaping ecosystems.
2. Show pictures or diagrams of prairie plants and animals, and ask students to share how weather might affect these organisms. (See below.)

Weather Data Analysis (See below for more detail.) (5 minutes):

1. Provide students with recent weather station data (e.g., temperature, humidity, wind speed, precipitation) from the PCC.
2. Guide students in analyzing the data to identify patterns and correlations between weather variables.
3. Encourage students to discuss how different weather conditions might affect prairie plants, animals, and soil.

Prairie Ecosystem Connections (5 minutes):

1. Facilitate a brief class discussion on the interconnectedness of weather and prairie ecology, emphasizing how changes in weather can impact the entire ecosystem.

Field Observation (5 minutes):

1. Encourage students to make brief observations about current weather conditions and how they might be influencing the prairie ecosystem.

Prairie Flora and Fauna Examples for Introduction

1. **Prairie Grasses (e.g., blue gramma, buffalo grass):** Weather, particularly precipitation and temperature, influences the growth and health of prairie grasses. In many ecosystems, sufficient rainfall promotes lush growth, while drought can stunt growth and make grasses more susceptible to wildfires. Extreme temperatures can also impact germination and flowering patterns. Prairie grasses have evolved to survive times of drought and fire.
2. **Prairie Wildflowers (e.g., prairie coneflower, sunflower):** Wildflowers rely on weather conditions for pollination, seed production, and growth. Rainfall and temperature affect the timing and intensity of flowering, while wind and humidity influence pollen dispersal and pollinator activity. Drought can reduce wildflower abundance, while excessive moisture may promote fungal diseases.
3. **Prairie Birds (e.g., meadowlarks, hawks spp.):** Wind speed and direction affect flight patterns and nesting success, while temperature influences foraging behavior and energy expenditure. Precipitation can impact food availability and nesting habitat quality, with prolonged droughts or heavy rains affecting breeding success.
4. **Prairie Mammals (e.g., prairie dogs, pronghorn):** Prairie mammals are adapted to cope with a range of weather conditions, but *extreme* weather events can pose challenges. Temperature fluctuations can affect metabolic rates and energy requirements, while precipitation influences food availability and vegetation quality. Severe storms, such as tornadoes, can disrupt habitats and endanger populations.
5. **Prairie Insects (e.g., butterflies, grasshoppers, pollinators):** Insects are highly sensitive to weather variations and play important roles in prairie ecosystems as pollinators, herbivores, and prey. Temperature influences insect development and activity levels, with warmer temperatures accelerating growth rates. Precipitation patterns affect breeding success and habitat availability for larvae and nymphs.

Weather Data Analysis - Detail

1. **Introduction to Weather Variables:** Start by introducing students to the different types of weather variables collected by the weather station, such as temperature, humidity, wind speed, and precipitation. Explain what each variable measures and why it is important for understanding weather patterns.
2. **Data Interpretation:** Provide students with a set of weather data collected over a period of time, such as daily or weekly readings from the weather station. Data can be presented in various formats, such as tables, graphs, or charts.
3. **Identifying Trends:** Encourage students to examine the data and look for patterns or trends in each weather variable. For example, they might notice that temperature tends to rise during the day and fall at night, or that precipitation levels vary from month to month.
4. **Comparing Variables:** Guide students in comparing different weather variables to see how they relate to each other. For instance, they might explore how temperature and humidity change together, or how wind speed correlates with precipitation events.
5. **Interpreting Results:** Encourage students to draw conclusions based on their analysis of the weather data. They should consider factors such as seasonality, geographic location, and local weather patterns when interpreting their findings.
6. **Discussion and Reflection:** Facilitate a class discussion where students can share their observations, interpretations, and questions about the weather data. Encourage critical thinking by prompting students to explain the reasons behind their conclusions and consider alternative explanations.
7. **Application to Real-World Scenarios:** Help students understand the practical implications of their weather analysis by discussing how weather data is used in fields such as agriculture, transportation, and disaster preparedness. Encourage them to think about how weather affects their daily lives and communities.