

THE BIRD ON S.T.E.M.

BASEBALL, METEOROLOGY AND CLIMATE



The Bird on STEM:

Baseball is played only under certain weather conditions. If it starts to rain too hard a game will be called, cancelled, postponed or delayed. If after a certain number of innings a game cannot be continued due to weather, a winner may be chosen based on the score at that moment.

Do you know how they decide when to postpone or delay a game? Meteorology. The Bird wants to know how else meteorology is involved in baseball.

The Pitch:

Meteorology is the study of the weather and is a part of baseball. Different stadiums have different **weather** patterns. Many have entirely different **climates**. (I didn't just say the same thing twice - weather and climate are not the same thing!) Take for example the difference between Boston or Seattle and Texas or Florida on a given day in October. Meteorology is also important to a baseball stadium grounds keeper, as weather will change what needs to be done to keep the field in tip-top shape.

If it starts to rain during a game, Major League Baseball and the Orioles use satellite Doppler radar to determine if they should continue. Doppler radar is only one tool used by meteorologists to monitor the weather. Let's investigate what else we can find out about the climate and weather at our favorite ballparks.

Swing Away:

- Divide into groups of no more than 4 people. Each group should choose a unique ball park from the list below.
- Before we start, we need to be clear about our vocabulary. Look up the definitions of the words, **weather** and **climate**. Record your understanding about these words' similarities and differences in the data section below.
- In what climate zone is your ball park? Use the map here to figure this out and record it in the data section.
- In your group, brainstorm the characteristics of the climate that might be important to know about if you were in charge of your ballpark. These types of things should include the average amount of annual rainfall, the average amount of moisture in the air and similar information. Think about things that the players, the fans and the groundskeeper might need to know. List your ideas in the data section below.



- Once each group has finished their brainstorming, share with the entire class. As a class, decide what data everyone will be gathering about their ballparks.
- Completed research on your ballpark, recording on your own paper.
- When it is time, you will report back to the class on the information you found. To report on your average rainfall, cut a piece of paper the same length as the number of inches of rainfall. Label the paper with your ballpark name and tape it to the wall or whiteboard to create a wall-sized bar graph.
- Your teacher will tell you how to report on your other data.



American League

Baltimore Orioles

Camden Yards, Baltimore, MD

Boston Red Sox

Fenway Park, Boston, MA

Chicago White Sox

Guaranteed Rate Field, Chicago, IL

Cleveland Indians

Progressive Field, Cleveland OH

Detroit Tigers

Comerica Park, Detroit, MI

Houston Astros

Minute Maid Park, Houston, TX

Kansas City Royals

Kauffman Stadium, Kansas City, MO

Los Angeles Angels

Angel Stadium, Anaheim, CA

Minnesota Twins

Target Field, Minneapolis, MN

New York Yankees

Yankee Stadium, Bronx, NY

Oakland Athletics

Oakland Alameda Coliseum, Oakland, CA

Seattle Mariners

Safeco Field, Seattle, WA

Tampa Bay Rays

Tropicana Field, St. Petersburg, FL

Texas Rangers

Globe Life Park, Arlington, TX

Toronto Blue Jays

Rogers Centre, Toronto, Ontario, Canada



National League

Arizona Diamondbacks

Chase Field, Phoenix, AZ

Atlanta Braves

SunTrust Park, Atlanta, GA

Chicago Cubs

Wrigley Field, Chicago, IL

Cincinnati Reds

Great American Ball Park, Cincinnati, OH

Colorado Rockies

Coors Field, Denver, CO

Los Angeles Dodgers

Dodger Stadium, Los Angeles, CA

Miami Marlins

Marlins Park, Miami, FL

Milwaukee Brewers

Miller Park, Milwaukee, WI

New York Mets

Citi Field, Corona, NY

Philadelphia Phillies

Citizens Bank Park, Philadelphia, PA

Pittsburgh Pirates

PNC Park, Pittsburgh, PA

San Diego Padres

Petco Park, San Diego, CA

San Francisco Giants

AT&T Park, San Francisco, CA

St. Louis Cardinals

Busch Stadium, St. Louis, MO

Washington Nationals

Nationals Park, Washington, DC



Keep Score: Record what you learn below.

1. What is the difference between climate and weather? How are they similar? Write out an explanation.

2. What climate zone is your ballpark in?

Climate Zones of the Continental United States



3. Brainstorm ideas of important characteristics of the climate at my ballpark:



Box Score:

In addition to the questions and directions your teacher gives you, answer these questions about the role of meteorology in baseball.

1. What might you have to worry about at your ballfield that others don't have to worry about?
2. How does the amount of moisture in the air relate to the climate of each ball park?
3. How many different climate zones are there in the United States?
4. How does your **climate** affect the **weather** in your zone?

The Bird's Final Word:

Weather is a major part of baseball and our lives everyday. The more we know about and understand weather, weather patterns and climates, the better equipped we are to deal with situations - just like the umpires, players and grounds crew in baseball.



TEACHER NOTES:

Implementation Notes

- Each group will need access to a computer. Groups can take turns on computers if the research is done over a longer period of time, in between other activities.
- Sharing and display of information can take several forms, depending on what data is collected. The idea of a wall-sized bar graph can be used for any quantitative data, such as average temperature, wind speed, heat index or average number of catastrophic events (hurricane, tornado, etc.). You might also ask the groups to report on the most common pest at their ballpark using a picture. Any historically significant catastrophic weather events can be linked to the climate zone, leading to a discussion about why the events(s) would not have occurred in other locations.

Background Information

Interactive Climate Zones map for the United States:

http://oceanservice.noaa.gov/education/pd/oceans_weather_climate/media/climate_zones.swf

Extension

Extend the idea of weather to space. A cool place to learn more about space weather:

<http://www.swpc.noaa.gov/>

NGSS Standards Connections:

MS-ESS2-5 - Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.

MS-ESS2-6 - Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.

Maryland College and Career Readiness Standards Connections for English Language Arts:

ELA 7W.9:

1. Draw evidence from literary or informational texts to support analysis, reflection and research.

ELA 6-8.SL.4

1. Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume and clear pronunciation.



ELA 6-8.RST.3, 9:

1. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
2. Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

*Students would conduct the multistep procedure for gathering information from multimedia sources for climate zones and average rainfall. Students can compare and contrast the data/information collected.

Maryland STEM Standards of Practice:

1. Learn and Apply Rigorous Science, Technology, Engineering, and Mathematics Content A. Demonstrate an understanding of science, technology, engineering, and mathematics content.
2. Engage in Logical Reasoning A. Engage in critical thinking.
6. Collaborate as a STEM Team A. Identify, analyze, and perform a STEM specific subject matter expert (SME) role. C. Listen and be receptive to ideas of others.

