FlightScope
BASEBALL

Hitting Glossary

1. Exit Speed: Speed of the baseball as it leaves the bat. Presented in Miles Per Hour (mph).

2022 MLB Avg: 88.98 mph
2022 MLB Avg Fly ball/ Line Drive: 93 mph
2022 MLB Avg Ground ball: 86 mph

2. Carry Distance: The total carry distance of the baseball after the batter has made contact with the baseball in fair play. Presented in Feet (ft).

2022 MLB Avg: 164 ft
2022 MLB Avg Home Run: 398 ft

3. Launch Angle: Indicates the vertical angle at which the baseball leaves the bat after the batter has made contact. Presented in degrees.

2022 MLB Avg: 12.58 degrees
Dribbler: <0 degrees
Ground Ball: 0-6 degrees
Low Line Drive: 6-15 degrees
High Line Drive: 15-25 degrees
Fly Ball: 25-50 degrees
Pop Up: >50 degrees

4. Batted Ball Direction: Indicates the horizontal angle at which the baseball leaves the bat after the batter has made contact. Presented in degrees.

Straight line from the tip of home plate to the middle of the outfield wall is 0 degrees.

Right field foul pole is 45 degrees right (positive).

Left field foul pole is 45 degrees left (negative).

5. Height: Indicates maximum height the baseball reaches after it has been hit by the batter. Presented in Feet (ft).

6. Hang Time: Indicates the amount of time the baseball was in flight from the point of contact to landing. Presented in Seconds.

7. Spray Chart: The total view of batted balls recorded by the FlightScope X3B in the current session.

8. Ball Flight Trajectory: 3D model that outlines the entire flight path of the baseball once it has been hit.

Pitching Glossary

1. Pitch Velocity: Indicates the initial speed of a pitch. Presented in Miles per Hour (mph).

2022 MLB Pitch Velocity Avg:

4S FB 93.9 mph

2S FB 93.4 mph

SL 84.4 mph

CB 79.2 mph

CH 86 mph

CT 88.6 mph

SP 87 mph

2. Pitch Release Vertical: Initial vertical (up-down) direction of the ball when it leaves the pitcher's hand. Presented in degrees. Positive numbers indicate the ball was released upward.
Negative numbers indicate the ball was released downward.

3. Pitch Release Horizontal: Initial horizontal (left-right) direction of the ball when it leaves the pitcher's hand. Presented in degrees.
From a pitcher's perspective, positive numbers indicate the ball was released to the right.
From a pitcher's perspective, negative numbers indicate the ball was released to the left.

4. Spin Rate: Indicates the rate at which the baseball is spinning as it leaves the pitcher's hand. Presented in Revolutions per Minute (rpm).

2022 MLB Spin Rate Avg:

4S FB 2259 rpm

2S FB 2168 rpm

SL 2408 rpm

CB 2470 rpm

CH 1741 rpm

CT 2332 rpm

SP 1369 rpm

5. Pitch Spin Direction: Indicates the direction at which the baseball is spinning once it's released by the pitcher. Presented in degrees.

6. Pitch Tilt: Indicates spin axis reformed into clock time. Fastballs and Changeups have backspin. 12:00 tilt is straight backspin. 6:00 tilt is straight topspin.

4S FB 12:15- 1:45
2S FB 1:00- 2:00
SL 8:00- 10:00
CB 6:00- 7:30
CH 12:00- 2:30
CT 11:00- 12:00
SP 12:00- 1:30

7. Release Height: The height of the pitcher's release points from the ground. Presented in Feet.

8. Release Side: Indicates the distance from the center of the rubber at which the pitcher releases the baseball.

From a pitcher's perspective, positive numbers indicate the ball was released from the right side.

From a pitcher's perspective, negative numbers indicate the ball was released from the left side.

9. Extension: Indicates the distance from which the pitcher releases the baseball relative to the pitching rubber. Presented in Feet.

10. Break Vertical: Vertical pitch movement determined at full distance. Presented in Inches.

11. Break Induced Vertical: Vertical pitch movement determined at a full distance reported without the effect of gravity. Represents where the pitch actually crossed home plate (height wise) and where it would have crossed if the same pitch was thrown in a straight line from release, affected by gravity and drag. Presented in inches. *Positive numbers do not indicate the ball rose.

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12. Break Horizontal: Horizontal pitch movement, determined at full distance, reported with the effect of gravity from the pitcher's perspective. Indicates the horizontal distance between where the baseball crosses home plate and where it would have crossed if the pitch was thrown in a straight line without any break.

Positive numbers indicate the baseball was to the right from a pitcher's perspective.

Negative numbers indicate the baseball was to the left from the pitcher's perspective.

13. Strike Zone Height: The height of the ball relative to home plate as the ball crosses the front of the plate. Presented in Inches.

14. Strike Zone Side: The distance between the center home plate to the ball as it crosses the front of the plate. Presented in Inches.

From a pitcher's perspective, positive numbers indicate the ball crossed the right side of the plate [inside to right handed hitter].

From a pitcher's perspective, negative numbers indicate the ball crossed the left side of the plate [inside to a left handed hitter].

15. Plate Speed: Speed of the pitch as it crosses the front of home plate. Presented in Miles per Hour.

16. Approach Angle Vertical: How steeply up or down the ball enters the zone, reported as the angle in degrees, as the pitch crosses the front of home plate. A negative number means it is sloping downward, while a positive number means it is sloping upward.

17. Approach Angle Horizontal: Left-right direction at which a pitched ball crosses the front of home plate, reported as an angle. A negative number indicates that the ball is moving from right to left from the pitcher's perspective as it enters the zone, and a positive number means that the ball is moving from left to right from the pitcher's perspective as it enters the zone.

18. Pitch Time: The time it takes for the ball to travel from release to the front of home plate. Measured in Seconds.

19. pfxx: The horizontal movement from the catcher's perspective, determined at the last 40 feet. This parameter is measured at y=40 feet regardless of the y0 value. Presented in Inches.

20. pfxz: The vertical movement from the catcher's perspective, determined at the last 40 feet. This parameter is measured at y=40 feet regardless of the y0 value. Presented in Inches.

21. x0: the left/ right distance of the pitch, determined at 50 feet. Presented in Feet.
From a catcher's perspective, negative numbers are to the left.
From a catcher's perspective, positive numbers are to the right.

22. y0: The distance in feet from home plate where the X3B is set to measure the initial parameters.

23. z0: The height of the pitch presented at the initial point. Presented in Feet.

24: vx0, vy0, vz0: the velocity of the pitch, in feet per second, in three dimensions, measured at the initial point.

25. ax, ay, az: the acceleration of the pitch, in feet per second per second, in three dimensions, measured at the initial point.

26. px: Horizontal position of the ball when it crosses the front of home plate from the catcher's perspective. Presented in Inches.

27. pz: Vertical position of the ball when it crosses the front of home plate from the catcher's perspective. Presented in Inches

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FS Cloud Pitching Summary

1. **NP:** Total Number of pitches thrown per pitch type, and in total.
2. **Pitch Usage%:** Represents the frequency of specific pitch types.
3. **Avg Speed:** Average pitch speed of specific pitch type.
4. **Avg Spin:** Average pitch spin of specific pitch type.
5. **Avg H Movement:** Average horizontal break of specific pitch type.
6. **Avg V Movement:** Average break induced vertical of specific pitch type.
7. **Zone%:** Percentages of pitches thrown inside the strike zone. **MLB Average 41%**
8. **Hits:** Total number of hits given up against specific pitch types.
9. **Strikeouts:** Total number of strikeouts against specific pitch types.
10. **Strikeout%:** Represents the frequency of strikeouts against specific pitch types.
11. **Swings:** Number of swings against specific pitch types.
12. **Misses:** Number of swings and misses against specific pitch types.
13. **Swing %:** Frequency of swings vs. specific pitch types.
14. **Whiff%:** Frequency of swings and misses vs. specific pitch types. Misses / by swings.
15. **Swinging Strike%:** Swinging strike rate is the rate of whiff across all pitches seen. Misses / by total pitches thrown of specific pitch type. **MLB Average 10.2%**
16. **Z-Swing%:** Overall percentage of time the batter swings at pitches inside of the strike zone. **MLB Average 69.5%**

17. **Z-Contact%:** Overall percentage of time the batter makes contact with a pitch inside the strike zone. **MLB Average 86.8%**
18. **O-Swing%:** Overall percentage of time a batter swings at pitches outside of the strike zone. **MLB Average 32.05%**

19. **O-Contact%:** Overall percentage of time a batter makes contact with a pitch outside the strike zone. **MLB Average 66.30%**

***Extended Tagging Functionality must be used for #8 - #19.**

Miscellaneous

F-Strike%: First Pitch Strikes / Plate Appearances. **MLB Average 60.7%**

CSW%: Called Strikes + Whiffs / Total Pitches. **MLB Average 26.4%**

***MLB Averages from 2022 Statcast data**