

OHIO UNIVERSITY BASEBALL



LINDSTROM'S LAB-BOOK

DEVELOPING PITCH ARSENAL
WITH ANALYTICS AND
RAPSOLO

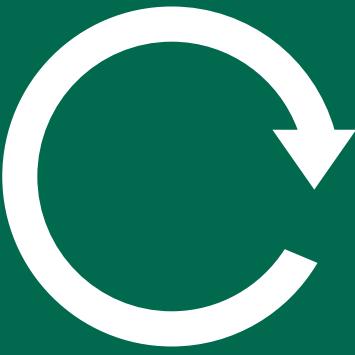
Created By :

Ian Lindstrom





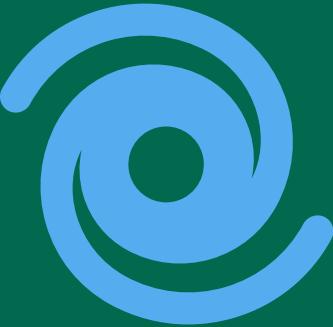
Matrices



Spin Definitions



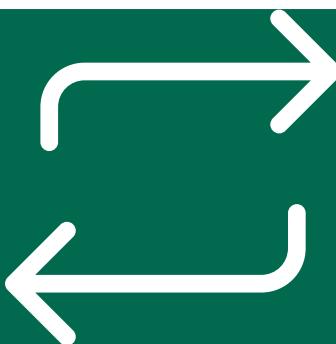
Fastball



Curveball

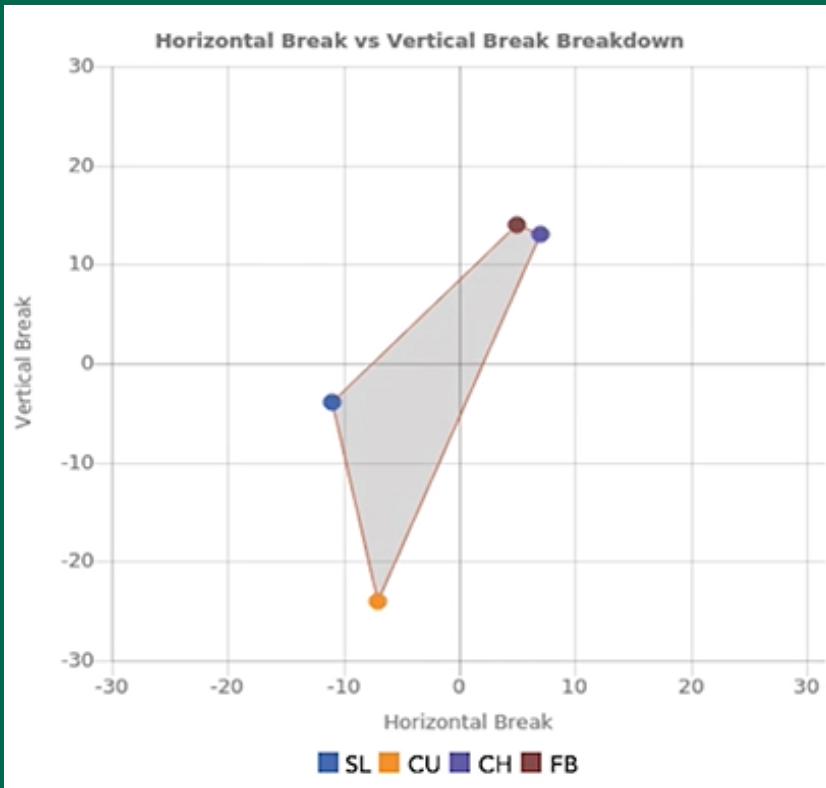


Slider



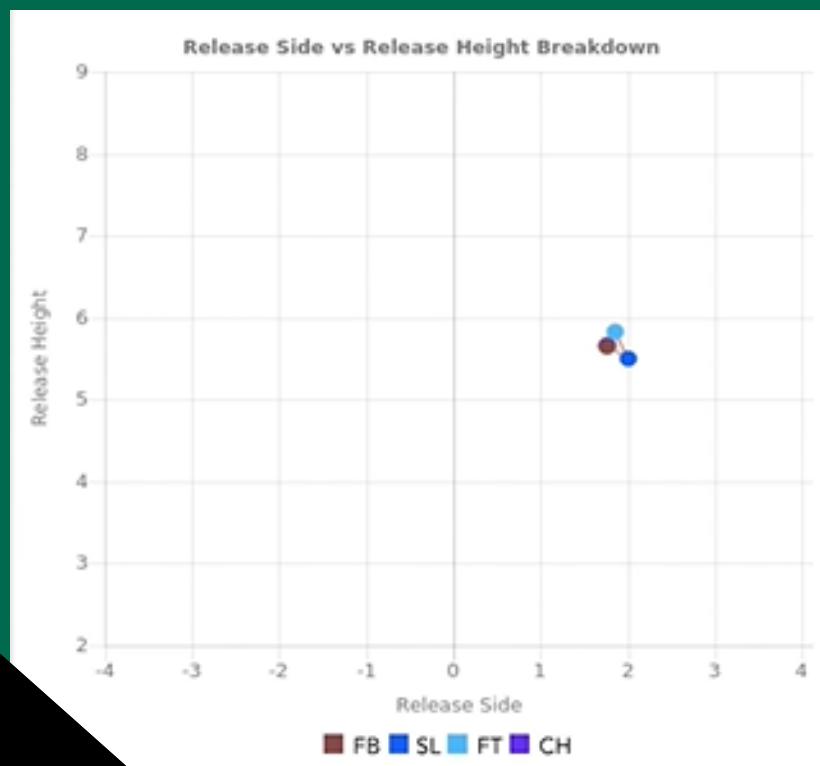
Changeup

Matrices



Movement Matrix

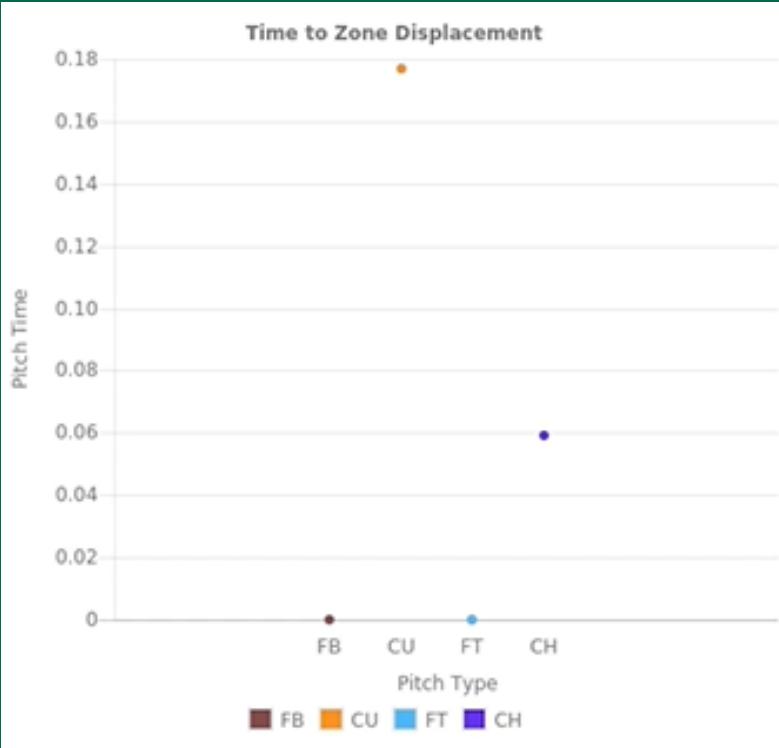
- Shows Vertical and Horizontal Break
- Positive: Up/Right
- Negative: Down/Left
- More Spread is GOOD
- Further away shows bigger movement difference in pitches



Release Matrix

- Shows Release Height (Y-axis) and Release Side (X-axis) in Feet
- Negative Release Side means left handed
- More similar is GOOD
- The more identical the pitch spot is, the better the tunneling becomes

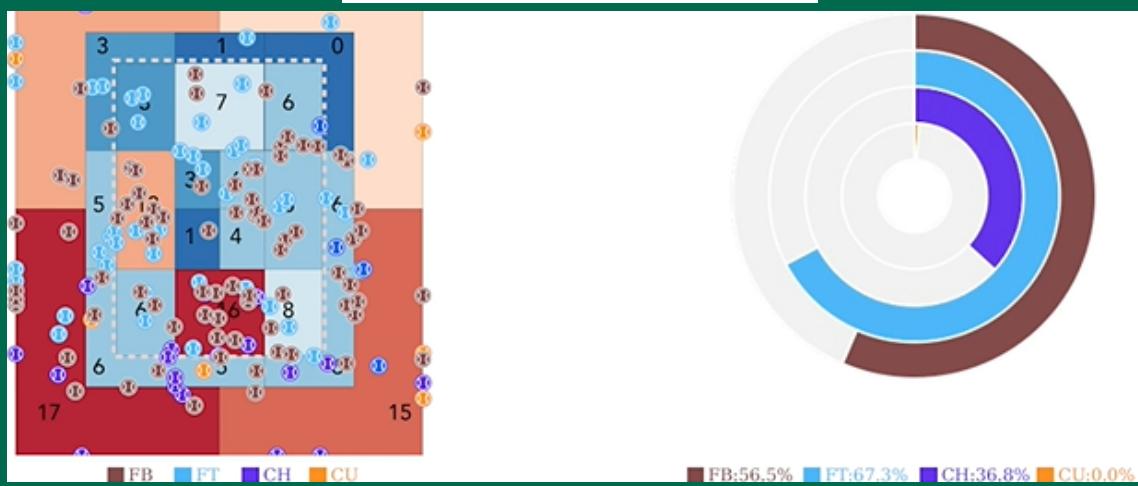
Matrices



Velocity Matrix

- Shows time of pitch from thrown to catcher
- The higher the pitch time, the slower the velocity
- Large spread is GOOD
- Fastballs and Changeups should be on opposite heights of graph for maximum efficiency

Location Matrix



- Shows locations of all pitches by zone
- Shows strike percentage by pitch
- High strike percentage is GOOD
- Helps identify which zones pitchers excel at hitting versus need to improve at

Spin Types

- 1) Total Spin
- 2) Gyro Spin
- 3) True Spin

Boring Definitions

Spin Efficiency (True Spin/Total Spin): Represents the % of RPM's dedicated to the spin-induced movement of the pitch

Total Spin: All the RPM's when thrown

Gyro Spin: The amount of gyroscopic spin present at time of release

True Spin: The total RPM's that affect the spin of the pitch.

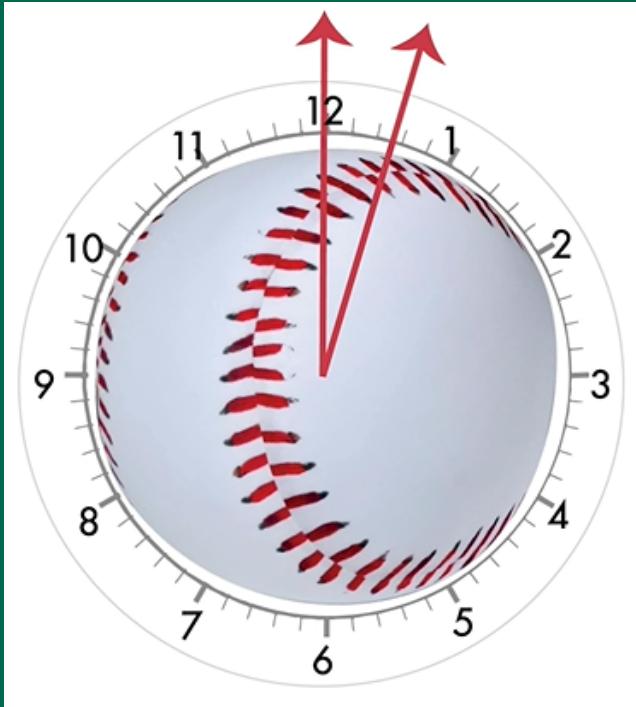
$$\text{Total Spin} - \text{Gyro Spin} = \text{True Spin}$$

Fastball Creation

Fastball Overview

- Normally lots of backspin @ 12'
- Sidespin occurs from sidearm pitchers
- Focus on either vertical break (normal release) or horizontal movement (sidearm release)

Fastball Creation



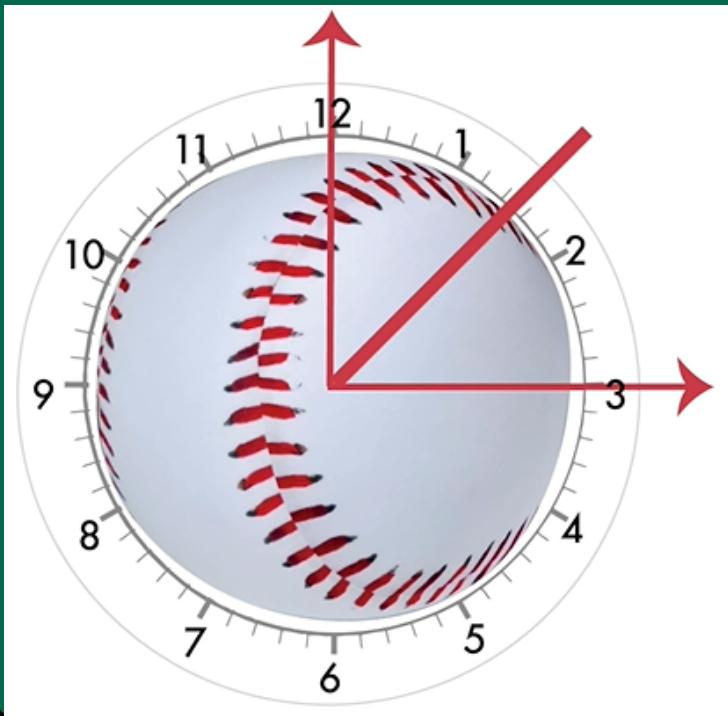
Fastball: Backspin

RHP

Spin Direction: 12:00 - 12:30
Spin Efficiency: 95% +
Gyro Spin: <5 Degrees

LHP

Spin Direction: 11:30 - 12:00
Spin Efficiency: 95% +
Gyro Spin: <5 Degrees



Fastball: Back/Side Spin

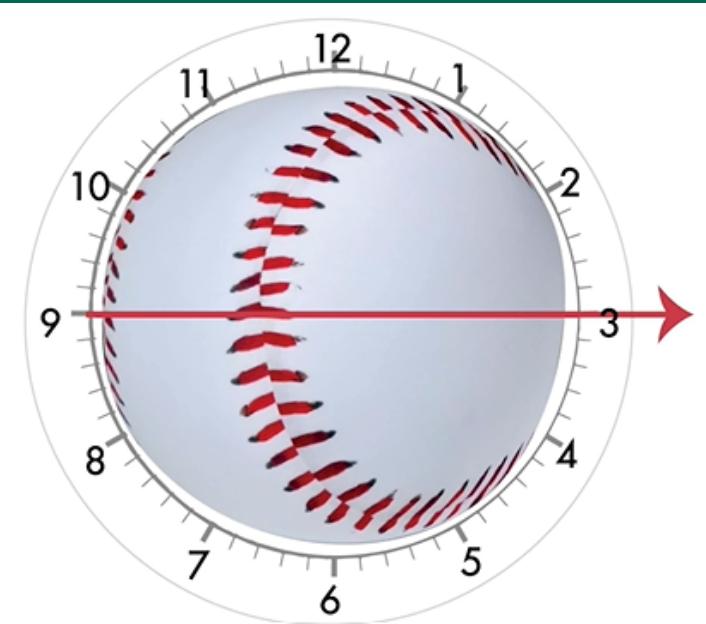
RHP

Spin Direction: 1:30
Spin Efficiency: 95% +
Gyro Spin: <5 Degrees

LHP

Spin Direction: 10:30
Spin Efficiency: 95% +
Gyro Spin: <5 Degrees

Fastball Creation



Fastball: Sidespin

RHP

Spin Direction: 3:00
Spin Efficiency: 95% +
Gyro Spin: <5 Degrees

LHP

Spin Direction: 9:00
Spin Efficiency: 95% +
Gyro Spin: <5 Degrees

Fastball Bonus Notes

Fastballs are defined by very high spin efficiency and high velocity

Low spin efficiency is caused by cutting the pitch and accidentally causing gyro spin

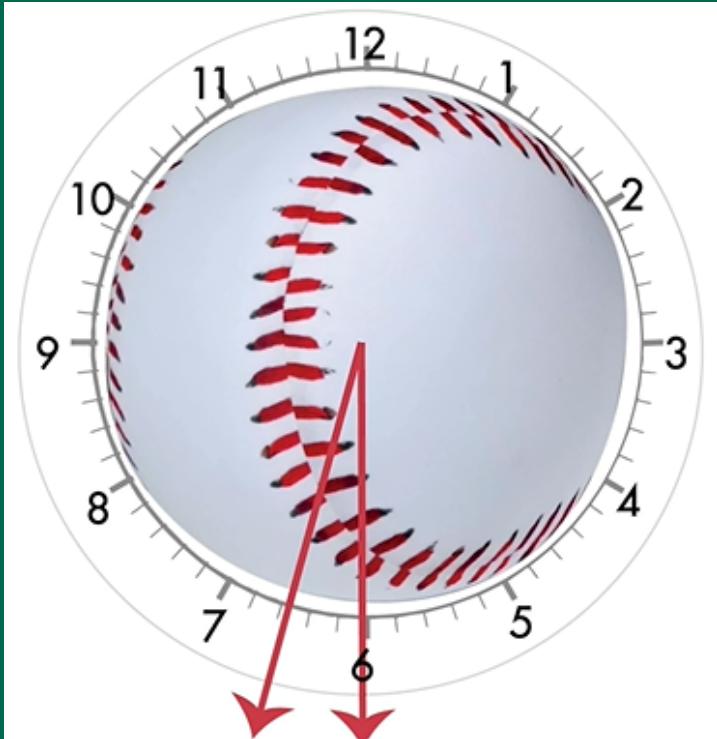
The sidespin fastball is used typically by lower arm-slot pitchers

Curveball Creation

Curveball Overview

- 3 Types: 12/6, Slurve, Sweeping
 - Common Curveball Issues include;
 - 1) Poor spin efficiency
 - 2) Blending slider and curveball
- *Caused by overcompensating and putting too much on side of the ball vs. the top

Curveball Creation



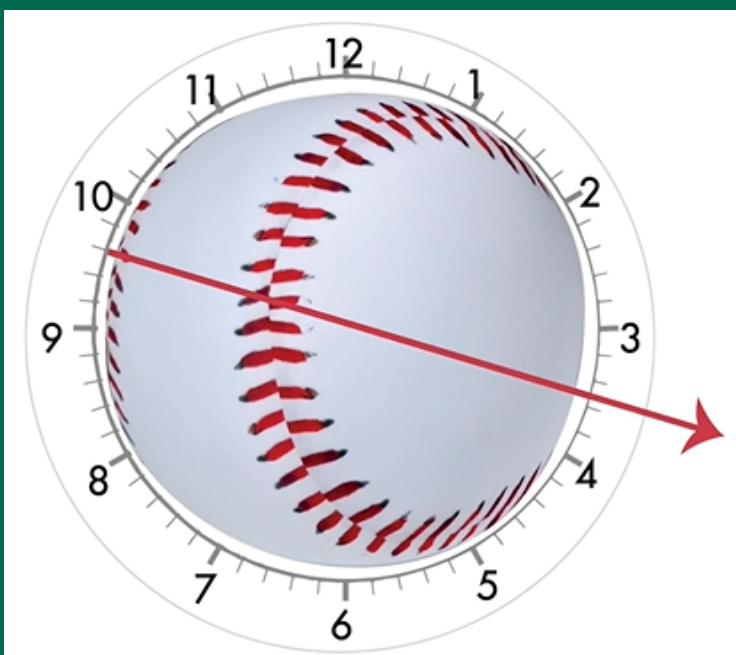
Curveball: 12/6

RHP

Spin Direction: 6:00 - 6:30
Spin Efficiency: 60% - 80%
Gyro Spin: <20 Degrees

LHP

Spin Direction: 5:30 - 6:00
Spin Efficiency: 60% - 80%
Gyro Spin: <20 Degrees



Curveball: Sweeping

RHP

Spin Direction: 8:00 - 9:00
Spin Efficiency: 60% - 70%
Gyro Spin: 30 Degrees

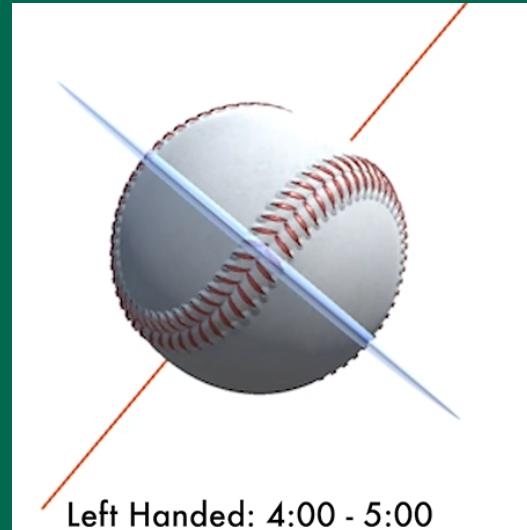
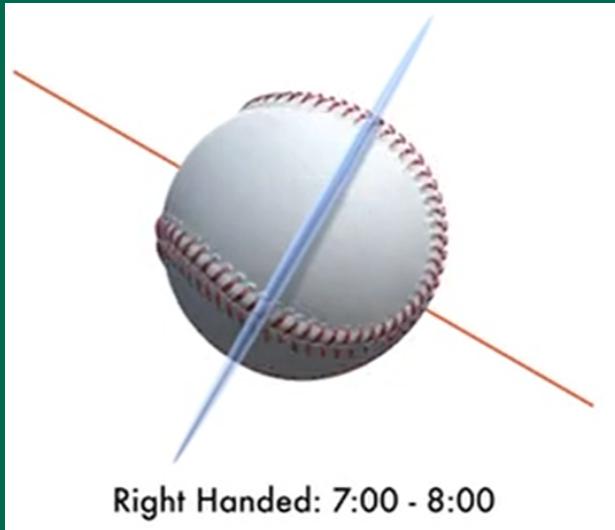
LHP

Spin Direction: 3:00 - 4:00
Spin Efficiency: 60% - 70%
Gyro Spin: 30 Degrees

This photo is for a LHP

Curveball Creation

Curveball: Slurve



Starting and Ending Quadrant very different

Total Break = Horizontal + Vertical Break

RHP

Spin Direction: 7:00 - 8:00
Spin Efficiency: 60% - 70%
Gyro Spin: 20 - 30 Degrees

LHP

Spin Direction: 4:00 - 5:00
Spin Efficiency: 60% - 70%
Gyro Spin: 20 - 30 Degrees

Slider Creation

Slider Overview

- 4 Types: Gryo, Neg. Vertical, Backspin, Horizontal Breaking
- Limited change in Spin Direction across slider movement profiles
- The lower spin efficiency, the better

Slider Creation



Notes

Verbal coaching que:
"Throwing a football"

Perfect Gyro Spin = No spin-related movement

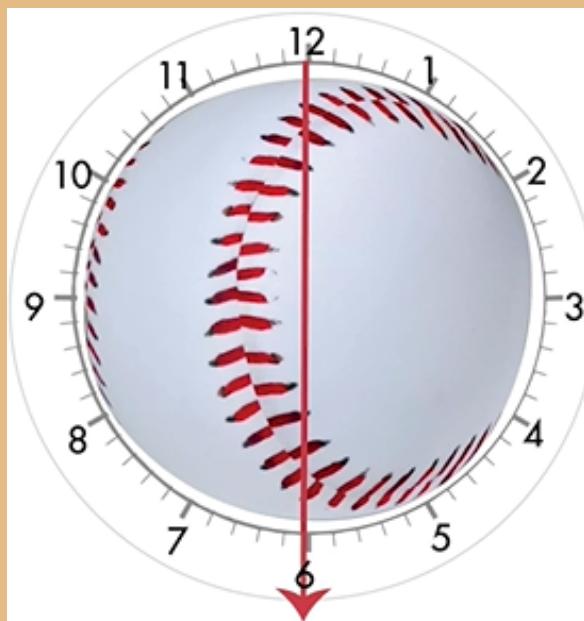
Slider: Gyro

RHP

Spin Direction: 11:00 - 12:00
Spin Efficiency: <10%
Gyro Spin: 90 Degrees

LHP

Spin Direction: 12:00 - 1:00
Spin Efficiency: <10%
Gyro Spin: 90 Degrees



Slider: Negative Vertical

RHP/LHP

Spin Direction: 6:00
Spin Efficiency: 10% - 30%
Gyro Spin: 70 Degrees

Notes

Ball is now angled not directly at home plate

Looks like a cutter but drops in last 10 feet

Slider Creation



Notes

Positive Vertical Movement (2-5 Inches)

Rotated spin axis

Traditionally high RPMs (3,000)

Slider: Backspin

RHP

Spin Direction: 11:00 - 12:00

Spin Efficiency: 25% - 35%

Gyro Spin: 55 - 65 Degrees

LHP

Spin Direction: 12:00 - 1:00

Spin Efficiency: 25% - 35%

Gyro Spin: 55 - 65 Degrees



WARNING: Unlike other 3 sliders, this pitch uses TILT not rotation

Creates glove side movement

Lots of horizontal movement

Different than a sweeping curve as the sidespin slider has less movement and is thrown harder

Slider: Sidespin

RHP

Spin Direction: 10:00 - 11:00

Spin Efficiency: 30% - 40%

Gyro Spin: 65 - 75 Degrees

LHP

Spin Direction: 1:00 - 2:00

Spin Efficiency: 30% - 40%

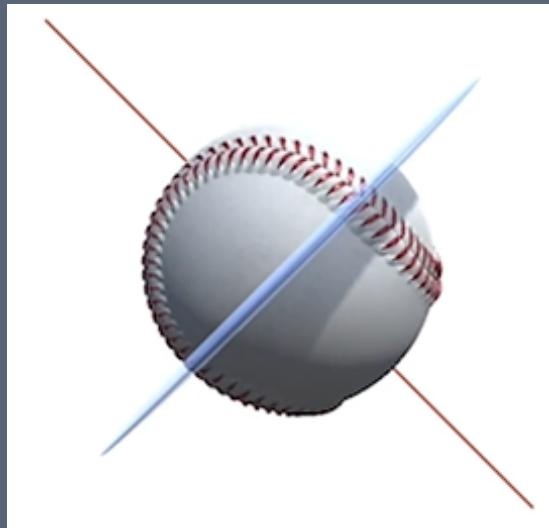
Gyro Spin: 65 - 75 Degrees

Changeup Creation

Changeup Overview

- 3 Types: Circle, Three Finger, Frisbee
- Changeups succeed more based off tunneling
- Should be released like fastball

Changeup Creation



Notes

Back of the Hand
Grip reduces RPM's, which leads
to negative vertical break

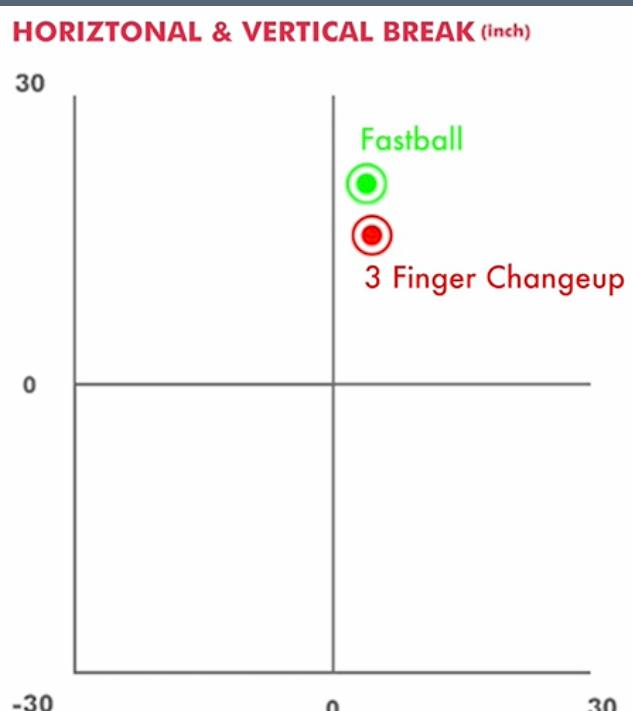
Changeup: Circle

RHP

Spin Direction: 1:30
Spin Efficiency: 40%
Gyro Spin: 30 Degrees

LHP

Spin Direction: 10:30
Spin Efficiency: 40%
Gyro Spin: 30 Degrees



Changeup: 3 Finger

"Choked" grip reduces
velocity and spin

Three finger changeup tends
to follow a pitcher's fastball
movement profile

Spin Direction: Same as
pitchers' fastball, differs on a
player-by-player basis

Changeup Creation

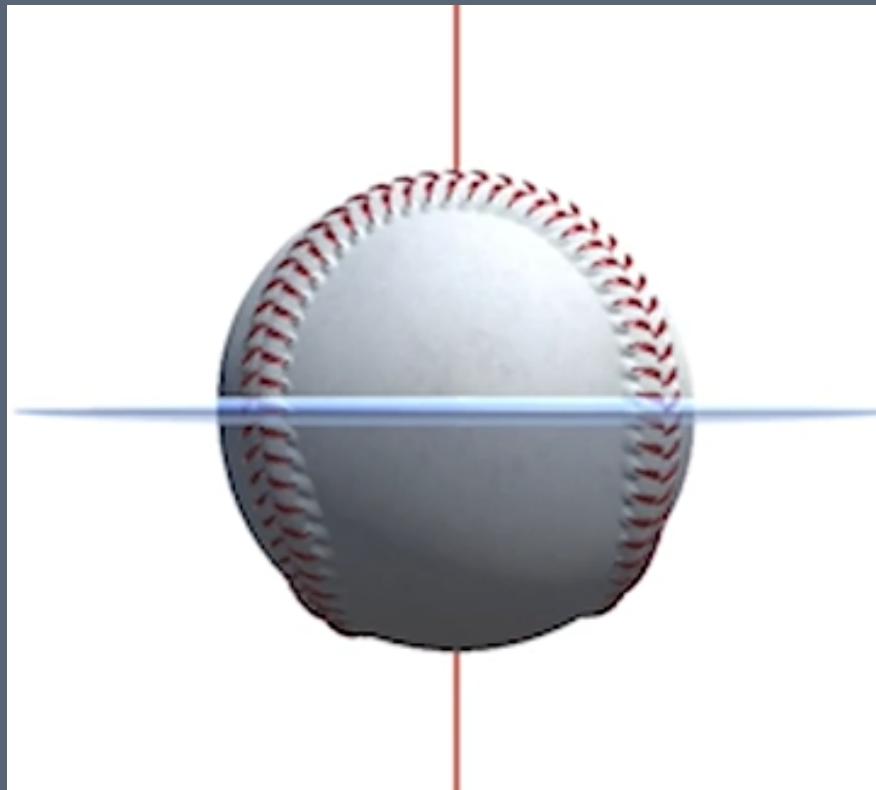
Changeup: Frisbee

RHP

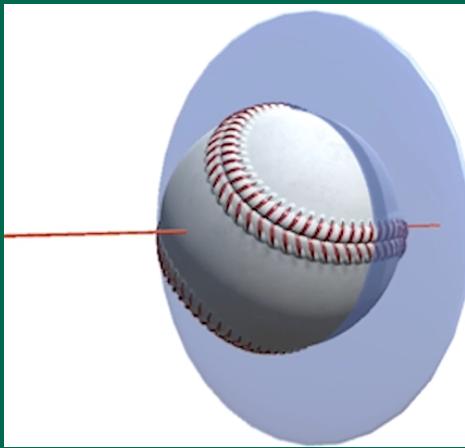
Spin Direction: 3:00
Spin Efficiency: >95%
Gyro Spin: <5 Degrees

LHP

Spin Direction: 9:00
Spin Efficiency: >95%
Gyro Spin: <5 Degrees



Miscellaneous Creation



Notes

- Target a movement profile in between a pitcher's backspin slider and fastball
- Cutter: Mimics the life of a fastball (RPM's/velocity) but with opposite horizontal movement

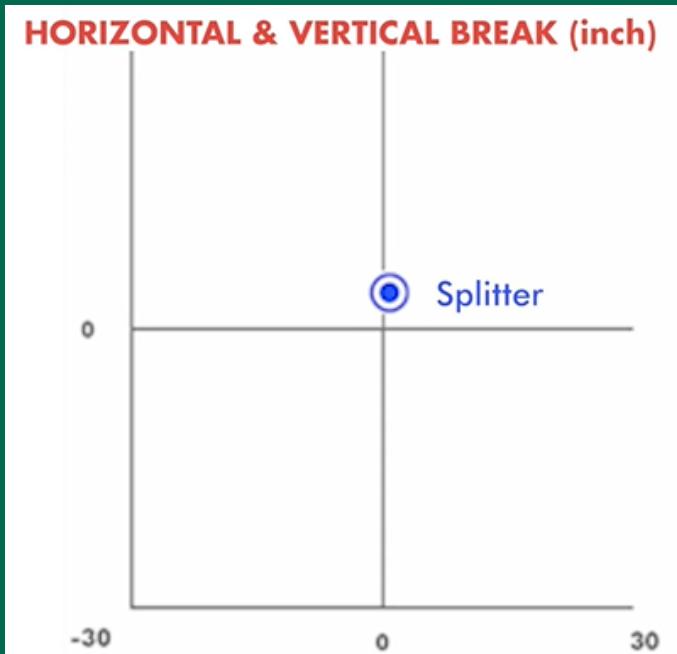
Cutter

RHP

Spin Direction: 11:30 - 12:00
Spin Efficiency: 50%
Gyro Spin: 45 Degrees

LHP

Spin Direction: 12:00 - 12:30
Spin Efficiency: 50%
Gyro Spin: 45 Degrees



Splitter

RHP/LHP

Spin Direction: 12:00
Spin Efficiency: 90% - 95%
Gyro Spin: <10 Degrees

Splitters should hug the center line of the break chart
(Minimal horizontal movement)

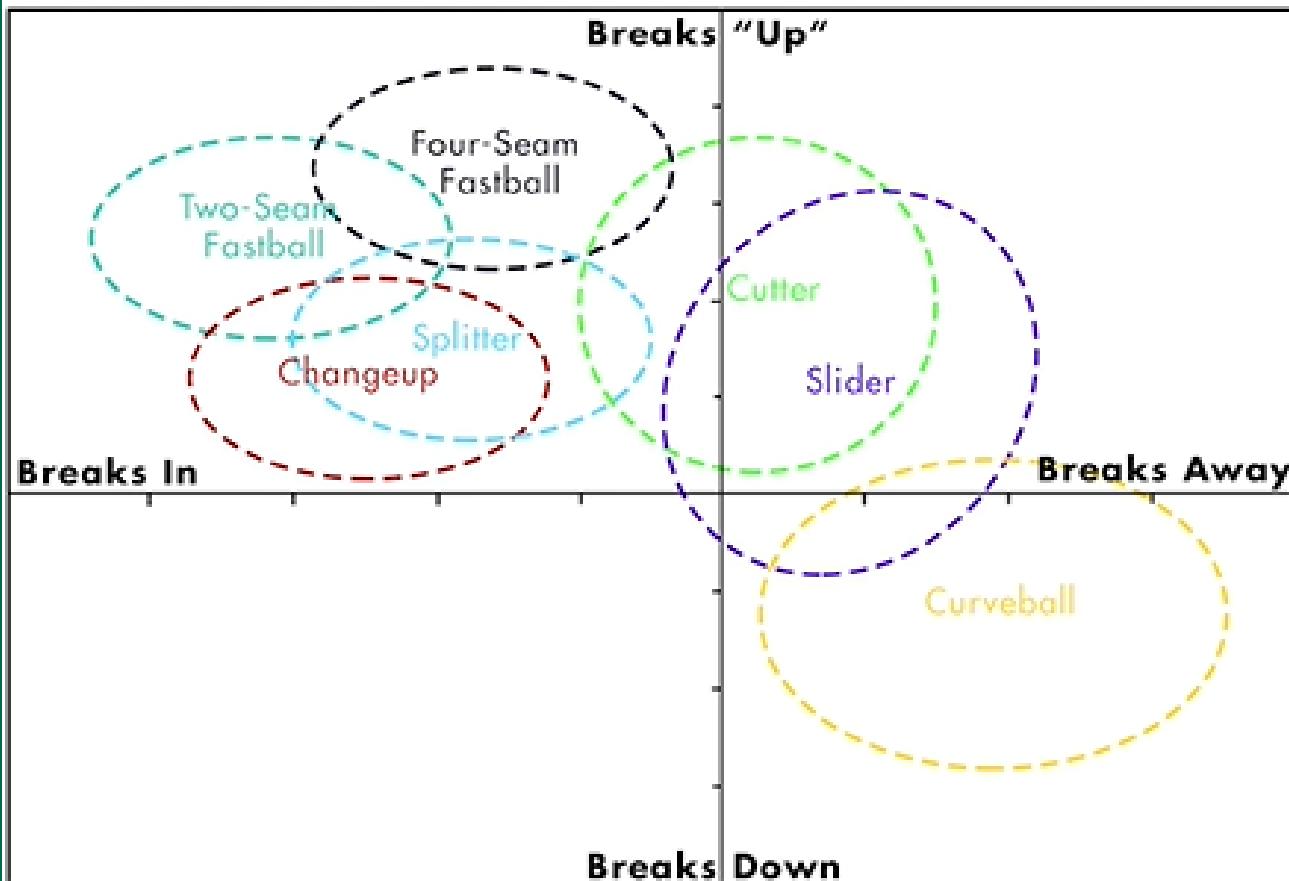
Final Notes

Knuckleball

<300 Total RPMS, allowing external forces to impact ball flights

Maximize velocity while maintaining low RPM's

Vertical vs. Horizontal Spin Deflection (right-handed pitcher)



*Catcher's point of view