

## Project: Breaking of the Baseball

### Does the slickness of a baseball affect the spin rate of the ball?

For Major League Baseball (MLB) pitchers to be successful, they must be able to throw different types of pitches effectively. Giving the ball different spin rates is a good way to accomplish this. Pitchers do this by varying their grip on the ball and flicking their wrists at different places during pitch delivery. The higher spin rates a pitcher can generate, the more the pitch will move around on its way to the plate, making it harder for a batter to hit. The movement is caused by the friction between the ball and the air. Although a baseball appears to be round and smooth, the stitches on are raised enough to cause the friction. They are also key to gripping a baseball, which is how the spin rate is controlled.

MLB ensures that all its baseballs meet specific standards after manufacturing, including the number of stitches, the mass of the ball, and the materials from which it is made. The baseballs used in the playoffs are made with the same materials, using the same standards as the regular season balls. The only difference is the playoff balls were stamped with gold lettering.



### Playoff Spin Rate

Some players claimed that during the 2017 World Series, the balls used felt slicker than normal. Was this really the case? The average spin rate of slider pitches during the regular season is listed below for the Houston Astros and the Los Angeles Dodgers. Find the average spin rate during the World Series from the data below. Compare the spin rate of the pitchers during the regular season to the pitchers during the 2017 World Series.

#### Average Spin Rate of Slider Pitches - 2017 Regular Season

Team	Spin Rate (revolutions/min)
Houston Astros	2717
Los Angeles Dodgers	2679

#### Average Spin Rate of Slider Pitches - 2017 World Series

(revolutions/min)

Team	Game 1	Game 2	Game 3	Game 4	Game 5	Game 6	Game 7
Houston Astros	2352	2542	2580	2330	2402	2625	2330
Los Angeles Dodgers	2608	2405	2482	2292	2501	2388	2614

*\*Data from MLB's Statcast*

Use your knowledge of friction to explain the differences in average spin rates between the regular season and the World Series. Are there other factors that could have caused the pattern in the data? Why isn't this data enough to completely support the players' claim that the balls during the playoffs were slicker than the ones used during the regular season? What additional data would strengthen their claim?