

6th Grade: Read and answer questions

1. One measure of a pitcher's performance is their ratio of strikeouts to walks. A single-season strikeout-to-walk ratio of 5:1 would be considered very good, and a single-season strikeout-to-walk ratio of 10:1 or better would be one of the best ratios of all time. In 2018, German Marquez led the Rockies with 230 strikeouts while issuing 57 walks. What was his strikeout-to-walk ratio?

Was his ratio higher or lower than that Scott Oberg's ratio, who had 57 strikeouts and 12 walks?

What is the strikeout to walk ratio of the pitcher today? How about the opposing pitcher?

2. If Trevor Story gets 3 hits in 10 at-bats, how many hits would you expect him to get in 50 at-bats if he continues to get hits at the same rate?

What would be his percentage of hits in at-bats, also known as batting average?

3. Entering the 2019 season, Nolan Arenado had hit 186 home runs in his 6 years with the Rockies. Assuming he continues that same rate, how close will Arenado be to 500 home runs when his contract with the Rockies ends in 2026, eight seasons from now?

4. In baseball, it is called a *quality start* when a starting pitcher completes six innings or more and gives up no more than three earned runs. If x is the number of innings completed and y is the number of earned runs given up, write inequalities using x and y that define a quality start.

5. For today's game, tickets in the Rockpile cost \$6 each. Write an equation that represents the relationship between the number of Rockpile tickets sold and the amount of money the Rockies will collect from selling Rockpile tickets.

Let's put that equation into action. If the Rockies sold 2,300 Rockpile tickets for \$4 each, how much revenue did they make? How about if the tickets were \$20 (like a Fireworks game!)?

6. In the past 10 seasons, these are the number of games won by the Rockies: 92 (2009), 83 (2010), 73 (2011), 64 (2012), 74 (2013), 66 (2014), 68 (2015), 75 (2016), 87 (2017), and 91 (2018).

What is the mean number of games the Rockies have won over this period?

What is the mean absolute deviation of games won across these 10 seasons?

When have the Rockies won more games than one MAD above their mean?

7. The strike zone is defined as a rectangle determined by the width of home plate (17 inches) and the distance from a batter's knees to their chest. Since different batters are different heights, the size of the strike zone can be different for different batters. Commonly, the height of the zone is estimated to be 2 feet. What is the area of the strike zone?

Suppose an umpire calls a strike for any pitch that touches either the left or right side of the zone, thus making it wider than home plate. If a baseball is about 3 inches in diameter, how much larger does this make the area of the strike zone?