HOW HARD IS BASEBALL COMPARED TO OTHER SPORTS?

Many say that baseball, which is commonly called America's national pastime, is a game with a low success rate. Consider Mookie Betts, one of the greatest players the sport has ever seen. He had a batting average (BA) of .346 during the 2018 season. His batting average was the highest of all players for that year.

A player's batting average is computed by dividing the number of times a player has a hit by the player's total number of at-bats.

$$BA = \frac{\text{Number of Hits}}{\text{Number of At-Bats}}$$

Notice that this formula looks a lot like a probability where the sample space is the set of all at-bats and the event is getting a hit.

When fans talk about batting averages, they commonly think of it in terms of probability. That is, if a player is batting .250, then there is a 25% chance that they will get a hit at their next at-bat.

1. Do you agree with the interpretation of the batting average as a probability? Is it possible to compute the theoretical probability that a player will get a hit when at bat? Explain your answer.

2. Let's return our attention to Mookie Betts. Betts had 520 at-bats during the 2018 season; how many hits did he have that season? Round your answer to the nearest whole number.

3. Suppose that Mookie Betts had another 20 at-bats during the 2018 season. Assume he had a BA of .500 for those extra 20 at-bats. What would his new 2018 batting average be with these extra 20 at-bats?

During the 2018 season, the entire Major League Baseball batting average was .248. That is, on average, a player would get a hit 24.8% percent of the time at bat.

4. Perform an internet search to find the definition of Field Goal Percentage (FG%) in basketball. Find the National Basketball Association average FG% in the 2018–19 season. Explain this number in terms of players and field goals.

5. Using this information, decide which sport has a higher success rate. Explain your answer.