

Student: _____ Class: _____ Date: _____

Analyzing Numerical Data: Indices Using Weighted Sums and Averages

I.C Student Activity Sheet 7: Slugging Averages

One example of a *weighted average* in sports is a batter's *slugging average* (or *percentage*) in baseball. The slugging average (*SLG*) is calculated using the following equation:

$$\text{SLG} = \frac{\text{TOTAL BASES}}{AB} = \frac{(1 \cdot S) + (2 \cdot D) + (3 \cdot T) + (4 \cdot HR)}{AB}$$

where S = singles, D = doubles, T = triples, HR = home runs, and AB = total at-bats.

Each single has a weight of 1, each double a weight of 2, each triple a weight of 3, and each home run a weight of 4. An at-bat without a hit has a weight of 0.

In his first season with the New York Yankees, Babe Ruth set a record for slugging average that stood for more than 80 years. In 1920, Ruth pounded 172 hits in 458 at-bats. His hits consisted of 73 singles, 36 doubles, 9 triples, and 54 home runs, resulting in a total base count of $(73 \cdot 1) + (36 \cdot 2) + (9 \cdot 3) + (54 \cdot 4) = 388$. When his total number of bases (388) is divided by his total at-bats (458), the result is .847, his slugging percentage for the season. This record was broken in 2001 by Barry Bonds, who had 411 total bases in 476 at-bats for a slugging average of .863. (Statistics from www.baseball-almanac.com)

1. Find the slugging average for a player with the following statistics:

$S = 68$
 $D = 40$
 $T = 4$
 $HR = 16$
 $AB = 320$

$$\frac{68 + 80 + 12 + 64}{320}$$

$$.700$$

2. REFLECTION: Is it possible to have a slugging average of more than 1?

Theoretically, what is the highest possible value for the slugging average? Could a player ever achieve this value during a baseball season? Give an example or explain why none exist.

NO \Rightarrow HARD TO BE PERFECT

3. A slugging average of .500 or higher is considered a sign of an excellent player. Suppose a player had 4 triples and a batting average of .300 in 400 at-bats (batting average = hits/at-bats). Determine a combination of singles, doubles, and home runs that gives this player a slugging average higher than .500.

Still using 400 at-bats, what is the maximum number of singles this player could have with a slugging average between .500 and .700? Justify your answer.