

How percentages are used in sports

By Gale, Cengage Learning, adapted by Newsela staff on 04.25.18

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Image 1. Kevin Durant goes up for a dunk against the Phoenix Suns in 2018, in Oakland, California. Durant is one of seven players in history to join the 50-40-90 club: players who have shooting percentage at or above 50% for field goals, 40% for three-pointers and 90% for free throws during an NBA season. Photo by: Marcio Jose Sanchez/AP Photo

Statistics are used very often in sports, and they're usually based on percentages. A percentage is a ratio or fraction over the number 100. For example, 50% is the same as $\frac{50}{100}$ or $\frac{1}{2}$.

In baseball, a ".300 hitter" is a player who was able to get a hit 30% of the time, which is very good. Players who get a hit 40% of the time are called ".400 hitters." They are legendary players. In basketball, very good shooters are able to make their free throws 90% of the time. That means if they shoot 100 times, the ball goes in 90 times.

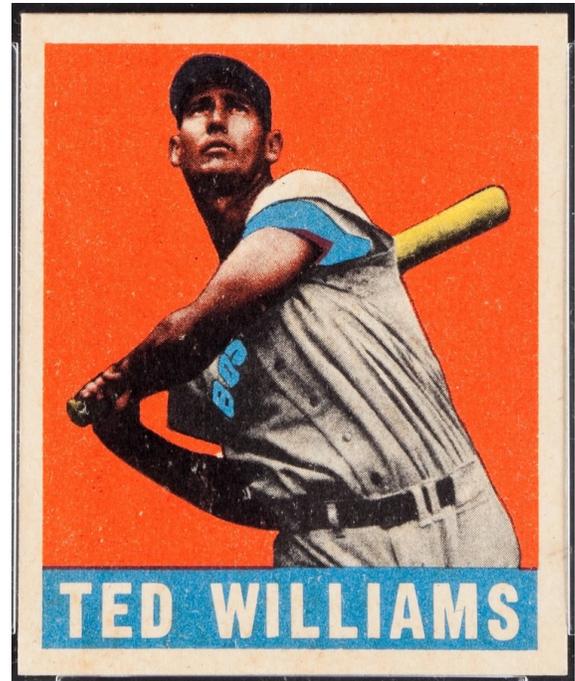
Sometimes percentages give useful information. Other times, they are just small details of a bigger story. Good coaches are able to tell the difference. For example, say Amanda and Claire are on a high school basketball team. Their coach wants to choose the most valuable player for the season.

Amanda scored 140 points by making 70 out of 100 2-point shots. She played for 15 minutes during each game. Claire scored 200 points by making 100 of 200 2-point shots. She played for 30 minutes each game.

Amanda and Claire can be compared by shooting percentage. Since Amanda took 100 shots and made 70, her percentage is 70%. Since Claire took 200 shots and made 100, her percentage is $\frac{100}{200} = \frac{1}{2} = 0.50 = 50\%$. Amanda's shooting percentage is better than Claire's.

Claire scored more points and played more minutes each game, though. The coach can use this information to make decisions. Amanda is a better shooter, even if she took fewer shots. The coach may give Amanda a chance to play more next season.

Other information can help to better understand the percentages. Maybe Amanda is worse than Claire in other parts of basketball, like passing. Maybe other teams felt Claire was the team's best player. They may have paid more attention to her. That is why it was harder for Claire to score.



Football also has many statistics, like a quarterback's completion percentage. Each time the quarterback throws the ball and a teammate catches it, it is called a completion. Completion percentage is the number of passes completed divided by the number of passes thrown.

This percentage can give the wrong idea, though. Think of a quarterback who completes 80% of his passes but never throws one that leads to a touchdown. That player is good at passing, but won't make the team earn any points. Now take a quarterback who only completes 50% of his passes. If those passes lead to touchdowns, this quarterback will be better than the first one.

Tournaments And RPI

There are hundreds of college sports teams. It is impossible to have them all play each other in one season. So, math is used to compare how well the teams are playing. Then, the best teams are chosen to play in a tournament or championship to figure out who is the very best.

Many sports use the RPI, or ratings percentage index. This is a math formula. In college basketball, the RPI has three parts: $RPI = \text{team's winning percentage} \times 25\% + \text{opponents' winning percentage} \times 50\% + \text{opponents' opponents winning percentage} \times 25\%$.

A team's "winning percentage" shows how often it won. The team's "opponents' winning percentage" shows how often all its opponents won. But those opponents also played against other teams. Our team didn't have a chance to play against them. The "opponents' opponents winning percentage" shows how often all those other teams won.

The RPI can be a bit confusing, so here's an example. If a team won 20 games out of 25 in a season, its winning percentage is $\frac{20}{25} = \frac{80}{100} = 80\%$. Say its opponents' winning percentage was 60%, and say the opponents played teams whose winning percentage was 50%. The RPI calculation would be $\frac{80}{100} \times \frac{25}{100} + \frac{60}{100} \times \frac{50}{100} + \frac{50}{100} \times \frac{25}{100}$. That works out to be 0.625.

A high RPI comes from winning against teams that also beat strong opponents. A team can lose more games than another team, but it will still be ranked higher because it played stronger opponents. Percentages are at the root of any RPI number.

Quiz

1 Read the introduction [paragraphs 1-9].

Which detail from the introduction explains why it is important to understand the meaning of percentages in sports?

- (A) In basketball, very good players are able to make their free throws 90% of the time. That means if they shoot 100 times, the ball goes in 90 times.
- (B) Sometimes percentages give useful information. Other times, they are just small details of a bigger story. Good coaches are able to tell the difference.
- (C) Since Amanda took 100 shots and made 70, her percentage is 70%. Since Claire took 200 shots and made 100, her percentage is $100/200 = 1/2 = 0.50 = 50\%$.
- (D) Maybe Amanda is worse than Claire in other parts of basketball, like passing. Maybe other teams felt Claire was the team's best player.

2 Read the paragraph from the section "Tournaments And RPI."

A team's "winning percentage" shows how often it won. The team's "opponents' winning percentage" shows how often all its opponents won. But those opponents also played against other teams. Our team didn't have a chance to play against them. The "opponents' opponents winning percentage" shows how often all those other teams won.

What is the MOST accurate explanation of this paragraph?

- (A) Figuring out RPI is too confusing for most people, so they only focus on their team's opponents.
- (B) Figuring out RPI means figuring out how many teams that played your teams' opponents also won or lost.
- (C) A team's winning percentage is less important than the winning percentage of its opponents.
- (D) A team's winning percentage is not important if the other teams it played also won most of their games.

- 3 Use the images and information from the article to select the TRUE statement.
- (A) Different percentages are sometimes used to understand different sports.
 - (B) Completion rate divides the number of passes thrown divided by the number completed.
 - (C) A good player in baseball has a hitting percentage of about 50%.
 - (D) RPI uses field goals, three-pointers and free throws to figure out whether a team will win.

- 4 Look at Image 1 and read the selection below from the introduction [paragraphs 1-9].

Think of a quarterback who completes 80% of his passes but never throws one that leads to a touchdown. That player is good at passing, but won't make the team earn any points. Now take a quarterback who only completes 50% of his passes. If those passes lead to touchdowns, this quarterback will be better than the first one.

How does the selection help the reader understand the image?

- (A) It describes the way that players can fix their game based on the image.
- (B) It describes the numbers that most often result from using the image.
- (C) It explains an important piece of information that is not shown by the image.
- (D) It explains that there are other ways to figure out completion rate not in the image.

Answer Key

1 Read the introduction [paragraphs 1-9].

Which detail from the introduction explains why it is important to understand the meaning of percentages in sports?

- (A) In basketball, very good players are able to make their free throws 90% of the time. That means if they shoot 100 times, the ball goes in 90 times.
- (B) **Sometimes percentages give useful information. Other times, they are just small details of a bigger story. Good coaches are able to tell the difference.**
- (C) Since Amanda took 100 shots and made 70, her percentage is 70%. Since Claire took 200 shots and made 100, her percentage is $100/200 = 1/2 = 0.50 = 50\%$.
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What is the MOST accurate explanation of this paragraph?

- (A) Figuring out RPI is too confusing for most people, so they only focus on their team's opponents.
- (B) **Figuring out RPI means figuring out how many teams that played your teams' opponents also won or lost.**
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