

PERCENTAGES ARE A HIT

Percentage, Ratios and Sports

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Percentages Are a Hit

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Skill Level

Intermediate, 6th Grade

Learner Outcomes

The learner will be able to:

- Explain batting averages.
- Calculate batting averages.
- Write batting averages as ratios, decimals, percentages.

Educational Standard(s) Supported

Math 6.RP.A.3

Success Indicator

Learners will be successful if they:

- Determine the highest batting average given a box score for a softball or baseball game.

Time Needed

30 Minutes

Materials List

- Local newspaper with box scores or data from a local game if available
- Internet Access
- White Board or Chalk Board
- Calculator
- Paper and Pencils

Introduction to Content

This lesson gives real-life applications for working with percentages and ratios in a sport setting, which interests many students. In this lesson, students will convert ratios to percentages and use ratios to add, subtract, multiply and divide.

Introduction to Methodology

This lesson uses modeling and hands-on approaches to aid students' comprehension. The lesson begins with assessing students' prior knowledge of ratios before calculating batting averages and determining the highest batting average for a given game.

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Tips for Engagement

Using local game data makes a nice addition to this lesson. Local teams, including student teams, can make this process fun and interactive, which helps make a lasting impression.

Also, make sure to give examples for both baseball and softball to appeal equally to females and males.

Terms and Concepts Introduction

Ratio – the relationship in quantity, amount or size between two or more things

Box Score – a printed score of a game (like softball or baseball) giving the names and positions of the players and a record of the play arranged in tabular form

Percent – a part of a whole number expressed in hundredths

Setting the Stage and Opening Questions

Ask students to share some of their favorite sports and ask how we can measure an athlete's performance during a game. Then, introduce box scores as a way of explaining how well a person played a game of softball or baseball.

Discuss how we can obtain a percentage from the ratios on a box score. Point out other types of ratios that students can see every day around their homes and communities. Discuss ratios as percentages and how to convert from one form to the other.

Ask questions to assess prior knowledge.

- What is a ratio?
- How do you convert from a ratio to a percentage?
- How do you know if a player is a good hitter?

Tell students, **“By the end of this lesson, you will be able to explain batting averages, calculate batting averages and write batting averages as ratios, decimals and percentages.”**

Experience

Ask students to check the box scores in the newspaper or supplied game data for two teams playing a baseball or softball game. Identify each player's AB (at bat) and H (number of hits). Model how to use these numbers to calculate each player's batting average, which shows how effective the hitter was in the game.

$$\text{Batting Average} = (\text{Number of Hits} \div \text{Number of Times at Bat}) \times 100$$

Have students make a chart showing the names of the players on each team. Use the Box Scores to show each player's batting average, showing the average as a fraction, decimal and percentage. Once you have checked for comprehension of batting average, ask students to determine which players had the highest batting averages.

Example

Name	AB	H	Fraction	Decimal	Percentage
Elizabeth	4	3	$\frac{3}{4}$	.75	75%
Susan	4	2	$\frac{1}{2}$	.50	50%
Abby	3	1	$\frac{1}{3}$	.33	33%

Elizabeth has the highest batting average.

Share

Ask the students the following questions:

- How did we use ratios to compare hitters? Should we consider any other factors?
- What are some issues you think may have contributed to a player's performance?

Process

- What does the ratio represent?
- Why are batting averages useful?

Generalize

- If we have a box score for other sporting events can we use this process to determine success? Why or why not?
- Can we use ratios for other events not relating to sports?

Apply

- Did this activity reveal the success of a player's hitting ability?
- How can we use ratios in other ways in real life?

Life Skill(s) 6th Grade

Understand the meaning of the information. (Head Thinking)

Understand the methods and skills for learning. (Head Thinking)

Use the senses to gain new information or find new ways to use information. (Head Thinking)

Identify/clearly define a problem or situation. (Head Thinking)

Send and receive information using speech, writing, gestures, and artistic expression. (Heart Relating)

Use basic reading, writing, arithmetic, and mathematical skills. (Hands Working)

Supplemental Information

Educational Standards Met

6.RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems (e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations)