cartoon corner
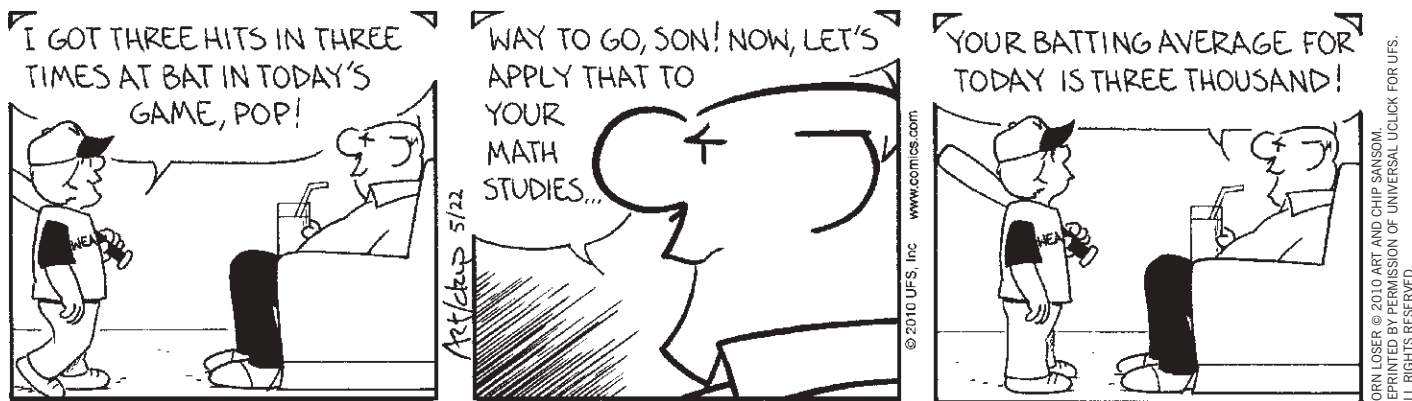
Name _____

BORN LOSER by Art and Chip Sansom

THE ALL STAR

Note: A *batting average* is calculated by hits ÷ at bats during a season or other time period. An *at bat* is calculated by the number of times a player comes up to the plate. (Specific rules govern *a hit*: A player must get to base without getting an out and without the opposition making an error. Also, an *at bat* is not counted if the player is walked, hit by a pitch, or commits a sacrifice to advance another player.)

1. What is the real batting average of the boy in the cartoon?

2. Suppose the boy goes "1 for 3" (he gets 1 hit in 3 at bats) the next day.
   a. What is his average for that day?

   b. What is his average for both days combined?

3. Suppose he maintains the ratio of hits to at bats from question 2b for 30 at bats. How many hits will he have? If he has 100 at bats, how many hits will he have?

4. In 1894, Hugh Duffy at .4397 set the record for the highest single-season batting average in professional baseball. (In listing top-ten records, statisticians list numbers with more precision.) If he batted 539 times that season, how many hits did he have?

5. Ty Cobb holds the career record for highest batting average. He played for 24 seasons and had 11,434 at bats. His career batting average was .366. How many hits did he have in his career? On average, how many at bats did he have for each hit?

6. Sportscasters usually ignore the decimal when they state a player's batting average. Someone who gets 4 hits in 10 at bats is said to be batting 400 instead of .400. Why might the father have said that the boy's batting average is 3000?

CHALLENGE

7. Slugging percentage, or SLG, is computed by adding the total bases a player gains on his own hits divided by his at bats. Thus, a player who gets a single (1 base) and a triple (3 bases) in 4 at bats would have this SLG:

$$\frac{1\,\text{base} + 3\,\text{bases}}{4\,\text{at bats}} = 1.000$$

   Ty Cobb's career SLG was .512. What are some possible numbers of singles, doubles, triples, and home runs that he could have hit during his career?

from the February 2012 issue of **mathematics** teaching in the MIDDLE SCHOOL

1. The boy's batting average in the cartoon is calculated from the ratio

$$\frac{\text{hits}}{\text{at bats}}.$$

   His average is 3/3 = 1.000. Batting averages are listed to three decimal places.

2. **a.** His average for the day is 1/3 = .333.
   b. For both days combined, he went 4 for 6, so his average is 4/6 = .667.

3. For 30 at bats, he would get 20 hits. Students could reason that 5×6 at bats = 30 at bats, so 5×4 hits = 20 hits. They could also set up and solve the following proportion, where x represents the number of times at bat:

$$\frac{4}{6} = \frac{x}{30}$$

Students could also reason that since he got 4 hits in 6 at bats, he gets a hit 2/3 of the time; 2/3 of 30 at bats is 20 hits. For 100 at bats, students could solve the problem in a similar way. However, 100/6 is not a whole number, so students should round to 17: $17 \times 4 = 68$ hits in 100 at bats. Students might also reason that since he gets a hit 2/3 of the time, 2/3 of 100 is about 67 hits. If both solutions arise, this situation would provide an opportunity to discuss rounding and expected accuracy.

4. Hugh Duffy had

$$.4397\frac{\text{hits}}{\text{at bats}} \times 539 \text{ at bats} \approx 237 \text{ hits.}$$

5. Ty Cobb had

$$.366\frac{\text{hits}}{\text{at bats}} \times 11{,}434 \text{ at bats} \approx 4185 \text{ hits}$$

for his career. Cobb had 11,434 at bats/4185 hits, or about 2.73 at bats for each hit.

6. The father may have mistakenly confused 1.000 with a sportscaster saying he batted 1000. If 1 hit for 1 at bat is 1000, 3 for 3 must be 3000.

7. Answers will vary. The actual numbers are 117 home runs, 295 triples, 724 doubles, and 3053 singles. Students might start by finding

$$.512\frac{\text{bases}}{\text{at bats}} \times 11{,}434 \text{ at bats,}$$

or about 5854 bases. Thus, one answer could be that he had 5854 singles. Since students could trade 2 singles for 1 double to get a new possibility, you might want to require that they assume at least 100 home runs, 200 triples, and 400 doubles (or other minimums).

FIELD-TEST COMMENTS

My algebra students had just completed a unit on statistics when they attempted this activity. Since most of them participate in a sport, we opened with a discussion of how statistics were used in their sports. Some of the students insisted that their coaches did not use statistics. When students were questioned further, they realized that any time someone kept track of how well a player performed, whether in practice or during a game, statistics played a role. Students wrapped up the activity with stories of consequences for subpar performances.

None of the students played baseball or softball, so we had to discuss the nature of batting averages while interpreting the cartoon and answering the first question. This activity provided a good review of percents and converting fractions, decimals, and percents. From there, students were able to complete the questions independently.

Students often hear statistics in the real world without thinking about the underlying math concepts. Activities such as this provide an opportunity for them to become more aware of how math is used in everyday life.

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OTHER IDEAS

- Ask students to research statistics on current players and predict the number of hits, SLG, and so on that players have for the current season.

- In the fall, students could compute current averages and project players' outcomes for the remainder of the season.