Lesson 2:
Batting Average *Part 1*: Fractions

Objective: Students will be able to:

    Understand that fractions represent parts of a whole.

    Set up fractions representing batting averages and other similar averages.

Time Required: 1 class period

Advance Preparation:

- Set up 4 stations around the classroom as follows:
    o Station 1: Quarters or other small change
    o Station 2: A pair of dice
    o Station 3: A deck of playing cards
    o Station 4: Marbles of different colors in a opaque bag

Materials Needed:

- Baseball cards – enough for each student to have one
- Prepare packets of "Station Worksheets 1-4". Make enough packet copies for students to work in pairs or in small groups.
- Scrap Paper
- Graph Paper
- Pencils

Vocabulary:

Batting Average - A measure of a batter's performance, calculated as the number of hits divided by the number of times at bat

Fraction - A number that represents equal parts of a whole

Lesson

1. To begin this lesson, explain that students will be looking more closely at one of the most common baseball statistics: **batting average**.

2. Explain that batting averages start out as fractions. Ask students, "What do **fractions** show?" Make sure that students understand that a fraction indicates part of a whole.

3. Write down the formula for batting average on the board: Hits (H)/At Bats (AB).

4. Discuss that most batters are not successful every single time they go up to bat. Ask students for examples of reasons that a player might not be successful when up to bat. *Possible answers include: strike out, fly out, etc.*

5. Explain that the fraction for batting average shows how many times the batter was successful in getting a hit, and how many times he went up to bat and tried to get a hit.

6. Give each student one baseball card and have students locate the columns for Hits (H) and At Bats (AB).

7. Ask students to share some examples of their players' numbers of hits and at bats. For each example, set up the numbers as a fraction. *For example, a student reports that Nick Swisher had 117 hits and 422 at bats. You would set up the fraction as 117/422.*

8. Continue setting up players' statistics in this manner until students grasp the concept that the fraction indicates number of successes compared to number of attempts.

9. Introduce the activity.

Activity

1. To give students additional practice setting up fractions similar to batting average, have students work through the stations you set up in advance of this lesson. Student should work in pairs or in small groups for this activity.

2. Provide pairs or groups with a prepared worksheet packet (included).

3. Explain instructions for each station:

    Station 1: Quarters
    The goal of this station is for students to see how often they can spin a quarter or other coin and have it turn up "heads."
    Have one student spin and another student record the results of each spin.
    Station 1 Average = Number of "heads" results/Total number of spins

    Station 2: Dice
    The goal of this station is for students to see how often they can roll the pair of dice and have the roll result in 2 even numbers.
    Have one student roll the dice and another student record the results of each roll.
    Station 2 Average = Number of rolls resulting in 2 even numbers/Number of total rolls.

    Station 3: Playing Cards
    The goal of this station is for students to see how often they can randomly draw a red card.
    Students should mix up the deck of cards before beginning this activity.
    Have one student draw a card at random and another student record the results of each draw.
    Station 3 Average = Number of red cards drawn/Number of total draws.

<u>Station 4: Marbles</u>
The goal of this station is for students to see how often they can randomly draw a blue marble.
Have one student choose a marble from the bag without peeking. Have another student record the color of each chosen marble.
Station 4 Average = Number of blue marbles/Number of marbles chosen.

4. Assist students with stations as necessary.

Conclusion:
To complete this lesson and check for understanding, come together as a class and have students compare the results of the different stations. For each station, chart each group's results on the board. Did each pair or group experience similar results at each station? Why or why not?
To extend this lesson, have students create graphs showing the results of each station.

NOTE Collect and save completed packets of "Station Worksheets 1-4" for use in Lesson 3.

Station 1: Quarters

Names: _____

_____

_____

Instructions:
1) Choose a recorder for the group.
2) Choose one person who will spin the quarter 10 times.
3) The recorder should place a check in the box showing if each spin resulted in "heads" or "tails".

Spin #	Heads	Tails
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

4) Count the number of times the spin turned up "heads."_____

5) Set up a fraction showing the **average** number of spins that turned up "heads."

Number of "heads" results =
Total number of spins

Station 2: Dice

Instructions:
1) Choose a recorder for the group.
2) Choose one person who will roll the pair of dice 10 times.
3) The recorder should place a check in the box if the roll resulted in 2 even numbers.

Roll #	2 Even Numbers
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

4) Count the number of times the roll came up as 2 even numbers. _____

5) Set up a fraction showing the **average** number of rolls that turned up 2 even numbers:

Number of rolls with 2 even numbers =
Total number of rolls

Station 3: Cards

Instructions:

1) Choose a recorder for the group.
2) Choose one person who will mix up the cards, then choose 10 cards without looking.
3) The recorder should place a check in the box showing if each card was a red card or a black card.

Draw #	Red	Black
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

4) Count the number of times a red card was chosen. _____

5) Set up a fraction showing the **average** number of times that a red card was chosen:

<u>**Number of red cards**</u> **=**
Total number of cards drawn

Station 4: Marbles

Instructions:
1) Choose a recorder for the group.
2) Choose one person who will choose 10 marbles from the bag without looking.
3) The recorder should place a check in the box showing whether or not the marbles chosen were blue or another color.

Choice #	Blue	Another Color
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

4) Count the number of times a blue marble was chosen. _____

5) Set up a fraction showing the **average** number of times that a blue marble was chosen:

<u>**Number of blue marbles**</u> **=**
Total number of marbles chosen