



Exploring the Problem

1. $p = P(\text{Red Sox win}) =$ _____

2. $q = P(\text{Red Sox lose}) =$ _____

3. For a single probability event with only two outcomes, $p + q = 1$.

☐ Always

☐ Sometimes

☐ Never



Binomial Probability In Baseball

Developing the Pattern

4. Expand the binomial $(p + q)^5$:

5. Substitute the values for p and q into the 4th term of the expansion and evaluate the result.
(count down terms 5th, 4th, 3rd, 2nd, 1st, 0th, left to right)

6. Find the probability that the student answers 4 of 5 quiz questions correctly using ${}_nC_x p^x q^{(n-x)}$.

7. Find the probability that the student answers 4 of 5 quiz questions correctly using **binomPdf(n, p, x)**.

8. Did your results for the two calculations for the student's quiz match?



Binomial Probability In Baseball

Extending the Pattern

9. Find $P(\text{Red Sox win 4 of 4 games})$.

10. Would you have expected that seven games were played with the Red Sox winning their fourth game with game 7? Explain.

11. Find $P(\text{Red Sox win 4 of 7 games})$.

12. Is finding the probability of winning 4 of 7 games using straight-forward binomial probability as performed in this activity a good model for the 7-games situation? How does the 4-of-7 games situation differ from the 4-of-4 situation?

13. How many games would you have expected to be played for a champion to be determined for the American League?

14. Identify at least 3 variables in baseball or any sport that make using past performance for determining probability problematic.