

Additional Practice**Investigation 3****What Do You Expect?**

1.
 - a. Jennifer is on her school's softball team. So far this season, Jennifer has 38 hits in 75 times at bat. Based on her current batting average, what are Jennifer's chances of getting a hit next time she is at bat? Explain your reasoning.
 - b. If Jennifer bats 5 times during a game, how many hits would you expect her to get? Explain.
 - c. Next season, Jennifer wants to average 6 hits for every 10 times at bat. If she bats 80 times during the season, how many hits will she need to get to achieve her goal?
2. Aaron bowls on his school's bowling team. Based on statistics from past games, the probability that Aaron will knock down all ten pins on his first ball (a strike) is $\frac{2}{5}$. If he does not get a strike, the probability that he will knock down the remaining pins with his second ball (a spare) is $\frac{3}{4}$.
 - a. In bowling, a turkey is three strikes in a row. If Aaron bowls three turns, what is the probability that he will get a turkey?
 - b. Aaron had 8 chances to make spares during one of his league games. How many of the spares would you expect him to have made? Explain.
 - c. In bowling, an open occurs when the bowler does not get a strike on the first ball and then does not get a spare on the second ball. When Aaron rolls two balls, what are his chances of getting an open?
 - d. Suppose Aaron bowls 30 practice frames. When he does not get a strike, he tries to get a spare.
 - i. How many strikes would you expect Aaron to get?
 - ii. How many spares would you expect Aaron to get?
 - iii. How many opens would you expect Aaron to get?

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3. In a game, two players take turns rolling two number cubes, each numbered 1 to 6. The numbers are added, and the sum is multiplied by 6. If the final result is an odd number, Player I gets 1 point. If the final result is an even number, Player II gets 1 point.
- List all the possible outcomes of a turn (that is, list the final results when the sum of two number cubes is multiplied by 6).
 - What is the probability that the final number will be odd? What is the probability that the final number will be even? Explain.
 - Is this a fair game?
4. The Alphabet Game costs \$0.25 to play. Before the game, 26 slips of paper, each with a different letter of the alphabet on it, are put into a bag. A player draws one slip from the bag. If the player draws a vowel (A, E, I, O, or U), he or she wins \$1.
- What is the probability of winning the game?
 - What is the probability of losing the game?
 - If a player plays the Alphabet Game 26 times, how much money would you expect the player to win or lose? Explain.
5. Suppose you play a game in which you toss 1 coin. You win \$10 if it lands HEADS and you win nothing if it lands TAILS.
- If it costs \$5 to play the game, would you expect to win or lose money in the long run? Explain.
 - If it costs \$10 to play the game, would you expect people to want to play the game? Explain.
 - If it costs \$6 to play the game, would you expect people to want to play the game? Explain.
 - If it costs \$4 to play the game, would you expect people to want to play the game? Explain.

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6. Suppose you play a game in which you toss 2 coins. You win \$10 if the coins match, and you win nothing if the coins do not match.
- If it costs \$5 to play the game, would you expect to win or lose money in the long run? Explain.
 - If it costs \$10 to play, would you expect people to want to play? Explain.
 - If it costs \$6 to play, would you expect people to want to play?
 - If it costs \$4 to play, would you expect people to want to play?
7. Suppose you play a game in which you toss 3 coins. You win \$10 if the coins match (all HEADS or all TAILS), and you win nothing if the coins do not match.
- If it costs \$5 to play the game, would you expect to win or lose money in the long run? Explain.
 - If it costs \$10 to play the game, would you expect people to want to play? Explain.
 - How much should you charge to play the game, if you want players to “break even” in the long run?
8. Suppose you play a game in which you roll 1 number cube. You win \$10 if the number on top is divisible by 3 without a remainder, and you win nothing otherwise.
- If it costs \$5 to play the game, would you expect to win or lose money in the long run? Explain.
 - If it costs \$10 to play the game, would you expect people to want to play? Explain.
 - If it costs \$4 to play, would you expect people to want to play?
 - If it costs \$3 to play, would you expect people to want to play?