# Case Study 3

## Probability and You!

The probability of an event is the long-run proportion of times the event would occur if the random process were repeated indefinitely (under identical conditions). Whether you realize it or not, probability affects decisions we make every day. For example, planning an activity around the weather forecast takes into account the probability of it raining. When crossing the street, we look both ways to minimize the probability we get hit by a car. Probablity is also a fundemental piece in statistics, and we will continue to re-visit this topic throughout the semester. Please read the following articles below and answer the following questions:

**Learning Objectives**

- Identify and define different types of probabilistic events
- Understand how probability affects decisions outside the classroom /vspace{15mm}

Article 1: https://www.boardgameprices.com/articles/roll-or-draw-basic-probabilities-in-board-games#:~:text=Most%20board%20games%20contain%20an,and%20so%20winning%20more%20often.

- Suppose you want to know the probability of rolling a 6 on a standard dice. What type of probability is this (Single Event, Conditional, And)?

- Suppose you roll a 6 on your very first roll. Congratulations! Now, you want to know the probability of rolling a 6 with the same dice. What type of probability is this (Single Event, Conditional, And)? Hint: Does the first roll depend on the second roll?

- Suppose you want to know the probability of drawing an Ace out of a standard 52 card deck (To review a standard deck of cards, see: https://en.wikipedia.org/wiki/Standard_52-card_deck). What type of probability is this (Single Event, Conditional, And)?

- Suppose you pull an Ace out of deck of cards. Congratulations! Now suppose after pulling that card, you want to know what is the probability of pulling another Ace. What type of probability is this (Single Event, Conditional, And)?

- Using the deck of cards scenario, come up with an example that would be considered an And probability. Use proper notation and define (in words) your event.

## What We Think vs What the Numbers Say (Part 2)

Please read article 2 and answer these questions below.

https://repository.upenn.edu/cgi/viewcontent.cgi?article=1055&context=oid_papers

- In your own words, define the temrs hot-hand and gambler's fallacy.

- How did the authors of this research collect there data? What is the sample size for this study?

- Report and define each variable in this study.

- Highlight the conclusions drawn from this study below.

- Based on this knowledge, brainstorm a plan for your friend to win big at the Roulette table! What would you suggest / not suggest your friend do? Post your ideas on the Discussion Board "Gambling Plan."

OR

- Reflect on two different scenarios where probability affects your everyday life. Be specific! Post your ideas on the Discussion Board "Probability and You!"

- Reflect on the learning objectives above. If you have any questions or comments, please post on the "Probability Questions" discussion post.