Objective: In this lesson, you will apply counting rules to determine probabilities and use them to make fair decisions.

Read the knowledge article and list the 5 counting rules:

**Five Counting Rules**

**Rule 1:** ______________________________________________________
_______________________________________________________

**Rule 2:** ______________________________________________________
_______________________________________________________

**Rule 3:** ______________________________________________________
_______________________________________________________

**Rule 4:** ______________________________________________________
_______________________________________________________

**Rule 5:** ______________________________________________________
_______________________________________________________

**Example (Counting Rule 2)**

Each participant in a charity lottery is given a unique number. The winner is chosen by picking one number from a bag of red balls numbered 1 through 5 and a second number from a bag of white balls numbered 0 through 9. If the number on the red ball is 3 and the number on the white ball is 9, for example, the player who is assigned the number 39 is the winner. Assuming that the total number of players is equal to the total number of possible outcomes, what is the probability each player has of winning?

- $\frac{1}{50}$
- $\frac{1}{5}$
- $\frac{1}{10}$
- $\frac{1}{10^5}$
Example (Counting Rule 3)

If you randomly place these five CDs on a 5-disc rack, what are the chances that you will place them alphabetically by artist?

- None Shall Pass by Aesop Rock
- Us by Brother Ali
- Middle Cyclone by Neko Case
- Lucky by Nada Surf
- The King is Dead by The Decemberists

Choose the correct answer:

- $\frac{1}{5}$
- $\frac{1}{100}$
- $\frac{1}{120}$
- $\frac{1}{250}$

Example (Counting Rule 4)

You have all 13 cards in the diamonds suit from a deck of cards. What are the chances that if you pick 3 cards at random from among these 13 cards, they will be jack, queen, and king in that order?

Choose the correct answer:

- $\frac{1}{1,716}$
- $\frac{1}{2,197}$
- $\frac{1}{39}$
- $\frac{1}{286}$

Example (Counting Rule 5)

You have all 13 cards in one suit from a deck of cards. What are the chances that if you pick 3 cards at random from among these 13 cards, they will be the jack, queen, and king in any order?

Choose the correct answer:

- $\frac{1}{13}$
- $\frac{1}{286}$
- $\frac{1}{52}$
- $\frac{1}{1,716}$