

# Unit 04 - Probability and Counting Methods

Content Area: **Math**  
Course(s): **Prob/Stat A**  
Time Period: **Marking Period 2**  
Length: **6 weeks**  
Status: **Published**

## Unit Introduction

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## Standards

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MA.S-CP.A.1	Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).
MA.S-CP.A.2	Understand that two events $A$ and $B$ are independent if the probability of $A$ and $B$ occurring together is the product of their probabilities, and use this characterization to determine if they are independent.
MA.S-CP.A.3	Understand the conditional probability of $A$ given $B$ as $P(A \text{ and } B)/P(B)$ , and interpret independence of $A$ and $B$ as saying that the conditional probability of $A$ given $B$ is the same as the probability of $A$ , and the conditional probability of $B$ given $A$ is the same as the probability of $B$ .
MA.S-CP.A.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.
MA.S-CP.A.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.
MA.S-CP.B.6	Find the conditional probability of $A$ given $B$ as the fraction of $B$ 's outcomes that also belong to $A$ , and interpret the answer in terms of the model.
MA.S-CP.B.7	Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ , and interpret the answer in terms of the model.
MA.S-CP.B.8	Apply the general Multiplication Rule in a uniform probability model, $P(A \text{ and } B) = [P(A)] \times [P(B A)] = [P(B)] \times [P(A B)]$ , and interpret the answer in terms of the model.
MA.S-CP.B.9	Use permutations and combinations to compute probabilities of compound events and solve problems.
MA.S-MD.B.6	Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).
MA.S-MD.B.7	Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).

## Essential Questions

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## Content

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- Movie: "21"
- Section 4.1: Introduction (Pgs. 172-173)
- Section 4.2: Sample Spaces and Probability (Pgs. 173-185)
- Section 4.3: The Addition Rules for Probability (Pgs. 189-193)
- Section 4.4: The Multiplication Rules and Conditional Probability (Pgs. 199-212)
- Section 4.5: Counting Rules (Pgs. 212-223)
- Section 4.6: Probability and Counting Rules (Pgs. 223-227)

## **Skills**

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- Determine the expected value of an event
- Differentiate between odds and probability
- Find Odds against or in favor of an event
- Find the probability of independent and dependent events
- Find the probability of mutually exclusive events
- Find theoretical and experimental probability
- Use Combinations to find number of outcomes
- Use Permutations to find number of outcomes
- Use the Counting principle to find number of outcomes