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

Standards

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 $P(A\ and\ B)/P(B)$, 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, $P(A\ or\ B) = P(A) + P(B) - P(A\ and\ B)$, and interpret the answer in terms of the model.
MA.S-CP.B.8	Apply the general Multiplication Rule in a uniform probability model, $P(A\ and\ B) = [P(A)] \times [P(B\,|\,A)] = [P(B)] \times [P(A\,|\,B)]$, 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

Content

- 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

- 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