Unit #2: Counting Methods

Content Area: **Mathematics**
Course(s): **Generic Course, Probability**
Time Period: **Semester 1 & 2**
Length: **3 weeks**
Status: **Published**

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 $P(A \text{ and } B)/P(B)$, 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.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.
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.

Enduring Understandings

1. Two events A and B are independent if the probability of A and B occurring together is the product of their probabilities
2. Two items are idependent if 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.
3. Permutations and combinations are used to determine the number of possible outcomes for a particular random experiment. This information is used to aid in determining the probability of an event occuring.

Essential Questions

1. What is a set? What is a subset?
2. How can we count the number of possibilities associated with a random experiment?
3. How do we know if two events are independent of one another?

Knowledge and Skills

1. Determine if two events are independent

2. Find the probability of two events occuring successively
3. Calculate the conditional probability of an event.
4. Determine the sample space of a random experiment using permutations and combinations

Resources

Online resources which include, but not limited to: Delta Math and Class Kick.