Unit 4: Probability

Content Area: **Mathematics**
Course(s): **Generic Course**
Time Period: **Semester 2**
Length: **7 weeks**
Status: **Published**

Standards

MA.K-12.2	Reason abstractly and quantitatively.
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.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.

Enduring Understandings

- Probability is a measure of likelyhood.
- A random experiment is an experiment in which there are multiple outcomes, and the outcome of the experiment is completely random.
- A sample space is the set of possible outcomes for a particular random experiment.
- Permutations and Combinations are used to count the number or possible outcomes for a random experiment
- Two events are said to be independent if the outcome of one event has no impact on the outcome of the other.
- Conditional probability allows you to compute the probability of one event given another event has occured.

Essential Questions

What is a set and what is it meant by the intersection and union of two sets?

What are the different strategies in determining the number of ways and the probability of an event occurring?

How can the probability of single and compound events be calculated?

What is meant by conditional probability?

Knowledge and Skills

- Use permutations and combinations to determine the number of possibilities in an experiment
- Determine the probability of a single event
- Determine the probability of successive events
- Know whether two events are mutually exclusive or not
- Find the probability of two events that are not mutually exclusive
- Determine if two events are independent of one another
- Calculate conditional probability

Transfer Goals

Apply the concepts of logic to probability. Recognize applications of this skill in daily life.

Resources

Intermediate Algebra with Applications 5/6th ed by Aufmann/Barker/Lockwood

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