Unit 3: Analyzing Patterns

Content Area: **Mathematics**
Course(s): **AP Statistics**
Time Period: **Semester 2**
Length: **10 weeks**
Status: **Published**

Standards

MA.K-12.8	Look for and express regularity in repeated reasoning.
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.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, $P(A \text{ and } B) = [P(A)] \times [P(B \mid A)] = [P(B)] \times [P(A \mid B)]$, 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.A	Calculate expected values and use them to solve problems
MA.S-MD.B	Use probability to evaluate outcomes of decisions
MA.S-MD.B.5b	Evaluate and compare strategies on the basis of expected values.

Enduring Understandings

Probability is used to make decisions.

Exploring random phenomena using probability and simulation helps to anticipate patterns in the world.

Essential Questions

1. What are the chances of an event occuring?

2. When is a numerical outcome of a chance process a binomial random variable or a geometric random variable?

3. How do sampling distributions demonstrate patterns in sample proportions and sample means?

Knowledge and Skills

- Calculate the probability of an event occuring.
- Find the probability of unions, intersections, and complements of two or more events occuring.
- Find the expected value of random variables.
- Determine if a random variable has a binomial setting or a geometric setting.
- Describe the shape, center, and spread of sampling distributions.

Transfer Goals

Computers can assist in processing simulations.

It is hard to find something truly random.

Resources

The Practice of Statistics, 4th edition by BFW

www.webassign.net

myap.collegeboard.org