Unit 5 Combinatorics

Content Area: **Math**
Course(s):
Time Period: **Marking Period 3**
Length: **4**
Status: **Published**

Unit Overview

This unit allows students to master the main ideas in probability and statistics and to use these ideas to make big decisions and inference.

Enduring Understandings

Understand independence and conditional probability and use them to interpret data.

Use the rules of probability to compute probabilities of compound events in a uniform probability model.

Use probability to evaluate outcomes of decisions.

Essential Questions

- Use fundamental counting rule

- Define and use factorial

- Solve permutations and combinations

- Probability with permutations and combinations

- Determining expected value

New Jersey Student Learning Standards (No CCS)

MA.S-CP.B	Use the rules of probability to compute probabilities of compound events in a uniform probability model
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. |

Interdisciplinary Connections

LA.W.9-10.6	Use technology, including the Internet, to produce, share, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
SCI.HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.

Technology Standards

TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.
TECH.8.1.12.D.CS3	Exhibit leadership for digital citizenship.
TECH.8.1.12.E.CS4	Process data and report results.
TECH.8.1.12.F.CS3	Collect and analyze data to identify solutions and/or make informed decisions.
TECH.8.1.12.F.CS4	Use multiple processes and diverse perspectives to explore alternative solutions.
TECH.8.2.12.C.CS2	The application of engineering design.

21st Century Themes/Careers

| CAEP.9.2.12.C.3 | Identify transferable career skills and design alternate career plans. |

Financial Literacy Integration

PFL.9.1.12.C.1	Compare and contrast the financial benefits of different products and services offered by a variety of financial institutions.
PFL.9.1.12.C.2	Compare and compute interest and compound interest and develop an amortization table using business tools.
PFL.9.1.12.C.3	Compute and assess the accumulating effect of interest paid over time when using a variety of sources of credit.

Instructional Strategies & Learning Activities

- Use graphing calculator to explore tables.
- Spend time with modeling activities.

- Spend at least one day dedicated to modeling problems
- Use problems and activities from book involving modeling problems
- Provide access to online book
- Provide access to book pages and problems through Canvas and Twitter
- Provide access to review keys
- Assign ExamView Questions to provide practice and assessment.

Formative Assessments

- Daily homework checks
- ExamView Questions
- Exit Tickets
- Warm-ups
- Quizzes

Summative Assessment

- Unit Tests