

ABSS Math Unit Planning Template

Introduction:

Grade/Course: 9_12 Adv Functions and Modeling		Suggested Unit Pacing (# of days): 8	
Unit Number and Title: Unit 11 - Combinatorics and Probability		Mathematical Practices	
		P1	Make sense of problems and persevere in solving them.
Conceptual Overview This unit introduces some basic combinatorics and probability and also introduces permutations.		P2	Reason abstractly and quantitatively.
		P3	Construct viable arguments and critique the reasoning of others.
		P4	Model with mathematics.
		P5	Use appropriate tools strategically.
		P6	Attend to precision.
		P7	Look for and make use of structure.
Essential Understandings		P8	Look for and express regularity in repeated reasoning.
SCS		<u>SCS.9 12.MA.1</u>	The learner will analyze data and apply probability concepts to solve problems.
SCS	The learner will analyze data and apply probability concepts to solve problems.	<u>SCS.9 12.MA.1.03.b</u>	Calculate and apply permutations and combinations.
CCSS	Conditional Probability and the Rules of Probability	<u>CCSS.9 12.MA.SP.S.CP.9</u>	(+) Use permutations and combinations to compute probabilities of compound events and solve problems.
CCSS		<u>CCSS.9 12.MA.SP.S.CP</u>	Conditional Probability and the Rules of Probability
CCSS	Conditional Probability and the Rules of Probability	<u>CCSS.9 12.MA.SP.S.CP.CL1</u>	Understand independence and conditional probability and use them to interpret data
CCSS	Conditional Probability and the Rules of Probability	<u>CCSS.9 12.MA.SP.S.CP.1</u>	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").
CCSS	Conditional Probability and the Rules of Probability	<u>CCSS.9 12.MA.SP.S.CP.2</u>	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.
CCSS	Conditional Probability and the Rules of Probability	<u>CCSS.9 12.MA.SP.S.CP.3</u>	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 .
	Conditional Probability		Recognize and explain the concepts of conditional probability and independence in everyday language

CCSS	and the Rules of Probability	<u>CCSS.9 12.MA.SP.S.CP.5</u>	and everyday situations. <i>For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.</i>		
CCSS	Conditional Probability and the Rules of Probability	<u>CCSS.9 12.MA.SP.S.CP.CL2</u>	Use the rules of probability to compute probabilities of compound events in a uniform probability model		
CCSS	Conditional Probability and the Rules of Probability	<u>CCSS.9 12.MA.SP.S.CP.6</u>	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.		
CCSS	Conditional Probability and the Rules of Probability	<u>CCSS.9 12.MA.SP.S.CP.7</u>	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.		
CCSS	Conditional Probability and the Rules of Probability	<u>CCSS.9 12.MA.SP.S.CP.8</u>	(+) Apply the general Multiplication Rule in a uniform probability model, $P(A \text{ and } B) = P(A)P(B A) = P(B)P(A B)$, and interpret the answer in terms of the model.		
CCSS		<u>CCSS.9 12.MA.SP.S.MD</u>	Using Probability to Make Decisions		
Learning Targets	<ul style="list-style-type: none"> • Solve problems involving combinations and permutations. • Distinguish between independent and dependent events and between mutually exclusive and mutually inclusive events • Find probabilities • Find odds for success and failure of an event. 				
Essential Terminology	<ul style="list-style-type: none"> • tree diagram • independent events • dependent events • combinatorics • Basic Counting Principle • permutations • combination • circular permutation • permutation with repetitions • probability • sample space • success • failure • complements • odds • mutually exclusive • inclusive events • conditional probability • Binomial Theorem Probability • binomial experiments • theoretical probability • experimental probability 				
Literacy Integration	Literacy Standards	Level	Standard	Standard Name	
	Literature Connections				
Technology Integration	Technology Standards	Level	Standard	Standard Name	
	Websites				
Assessment	Formative				
	Performance Tasks				
	Summative				

Resources		
Learning Plan	Instructional Sequence	<ul style="list-style-type: none"> ● Permutations and Combinations (13-1) ● Permutations with Repetitions and Circular Permutations (13-2) ● Probability and Odds (13-3) ● Probabilities of Compound Events (13-4) ● Conditional Probability (13-5) ● The Binomial Theorem and Probability (13-6) ● Review ● Assessment
Differentiation	Remediation	
	Enrichment	