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 10 - Sequences and Series		**Mathematical Practices**	
		P1	Make sense of problems and persevere in solving them.
Conceptual Overview	This unit reviews arithmetic and geometric sequences and series and introduces infinite sequences and series the study covers limits, sums, convergence, divergence, and sigma notation. Also covered is the study of Pascal's Triangle, binomial expressions, the Binomial Theorem, and Fibonacci sequence.	**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.
		P8	Look for and express regularity in repeated reasoning.
Essential Understandings			
SCS	The learner will use functions to solve problems.	**SCS.9_12.MA.2.05**	Use recursively-defined functions to model and solve problems.
SCS	The learner will use functions to solve problems.	**SCS.9_12.MA.2.05.a**	Find the sum of a finite sequence.
SCS	The learner will use functions to solve problems.	**SCS.9_12.MA.2.05.b**	Find the sum of an infinite sequence.
SCS	The learner will use functions to solve problems.	**SCS.9_12.MA.2.05.c**	Determine whether a given series converges or diverges.
SCS	The learner will use functions to solve problems.	**SCS.9_12.MA.2.05.d**	Translate between recursive and explicit representations.
CCSS	Seeing Structure in Expressions	**CCSS.9_12.MA.AL.A.SSE.4**	Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. *For example, calculate mortgage payments.*★
CCSS	Arithmetic with Polynomials and Rational	**CCSS.9_12.MA.AL.A.APR.CL1**	Perform arithmetic operations on polynomials

	Expressions		
CCSS	**Creating Equations**★	**CCSS.9_12.MA.AL.A.CED.CL1**	Create equations that describe numbers or relationships
CCSS	**Interpreting Functions**	**CCSS.9_12.MA.F.IF.3**	Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. *For example, the Fibonacci sequence is defined recursively by $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ for $n ≥ 1$.*
CCSS	**Build a function that models a relationship between two quantities**	**CCSS.9_12.MA.F.BF.1.a**	Determine an explicit expression, a recursive process, or steps for calculation from a context.
CCSS	**Building Functions**	**CCSS.9_12.MA.F.BF.2**	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★
Learning Targets			● Identify and find nth terms of arithmetic, geometric, and infinite sequences. ● Find sums of arithmetic, geometric, and infinite series. ● Determine whether a series is convergent or divergent. ● Use sigma notation ● Use the Binomial Theorem to expand binomials.
Essential Terminology			● Sequence ● terms ● arithmetic sequence ● common difference ● nth term ● arithmetic means ● recursive formula ● arithmetic series ● nth partial sum ● geometric sequence ● common ratio ● geometric means ● geometric series ● infinite sequence ● limit ● Theorems of limits ● infinite series ● convergent series ● divergent series ● Sigma notation ● Binomial Theorem ● Pascal's Triangle ● Fibonacci Sequence ● Exponential series ● Trigonometric series

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**	● Arithmetic Sequences and Series (12-1), Recursively Defined Functions ● Geometric Sequences and Series (12-2) ● Infinite sequences and Series (12-3) ● Convergent and Divergent Series(12-4) ● Sigma Notation and nth term (12-5) ● Binomial Theorem (12-6) ● Review ● Assessment
Differentiation	**Remediation**	
	Enrichment	