Pre-Calculus H Unit 7: Sequences and Series

Unit #:	APSDO-00019265	Duration:	2.0 Week(s)	Date(s):	

Team:
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Grades:
10, 11, 12
Subjects:
Mathematics

Unit Focus

In this unit, students will study arithmetic and geometric sequences and series. They will represent and evaluate series in summation notation. Students will also study how sequences and series apply to real world models. They will recognize non arithmetic and geometric patterns both explicitly and recursively. Summative assessments may include projects, labs and test. Primary instructional resources for this unit include Pre-Calculus with Limits, Larson, Hostetler, and Edwards, 2008.

Stage 1: Desired Results - Key Understandings

Established Goals

Common Core
Mathematics: 11

- Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
  CCSS.MATH.CONTENT.HSF.BF.A.2
- Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.
  CCSS.MATH.CONTENT.HSF.IF.A.3
- Derive the formula for the sum of a finite geometric series (when the common

Transfer

T1 (T50) Based on an understanding of any problem, initiate a plan, execute it and evaluate the reasonableness of the solution.
T2 (T53) Articulate how mathematical concepts relate to one another in the context of a problem or in the theoretical sense.
T3 (T51) Examine alternate methods to accurately and efficiently solve problems.
T4 (T52) Use appropriate tools strategically to deepen understanding of mathematical concepts.
T5 (T23) Use functions or equations to model relationships among quantities.
T6 (T24) Classify, interpret, and compare functions or equations.

Meaning

Understandings	Essential Questions
U1 (U206) A function can represent how	**Q1** (Q203) What is the relationship

ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.* *CCSS.MATH.CONTENT.HSA.SSE.B.4* • Look for and express regularity in repeated reasoning. *CCSS.MATH.MP.8* • Look for and make use of structure. *CCSS.MATH.MP.7* • Reason abstractly and quantitatively. *CCSS.MATH.MP.2*	quantities in the real world relate to one another. **U2** (U207) Recognition of predictable mathematical patterns supports the analysis of functional relationships and the prediction of data. **U3** (U510) Every problem is a member of a category of problems that has a similar structure and set of characteristics. **U4** (U560) Patterns and structures are characterized by consistent relationships. **U5** (U561) Recognition of patterns and structures fosters efficiency in solving problems.	between/among these values? **Q2** (Q208) What function best models the data? How do its characteristics help me make predictions? (Gr. 8-12) **Q3** (Q511) What characteristics/attributes define this type of problem? **Q4** (Q513) How could this strategy be used to solve similar problems? **Q5** (Q560) What is the pattern/structure in this problem? **Q6** (Q572) How does understanding the pattern/structure help me solve the problem?
	Acquisition of Knowledge and Skill	
	Knowledge	**Skills**
		S1 Finding the nth term using arithmetic and geometric sequences **S2** Writing arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms **S3** Deriving the formula for the sum of a finite geometric series and using the formula to solve problems **S4** Writing a series using summation notation **S5** Understand the difference between a

		sequence, an arithmetic sequence, and a geometric sequence **S6** Understand that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers (e.g., Fibonacci Sequence) **S7** Understand how to determine a sum from summation notation **S8** Understand the difference between a series that converges vs. diverges **S9** Understand the relationship between the formula for a finite geometric series and an infinite geometric series

Stage 3: Learning Plan

Coding	Code	Description of Learning Activity