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Curriculum Units by Fellows of the National Initiative
2017 Volume V: From Arithmetic to Algebra: Variables, Word Problems, Fractions and the Rules

Sequencing Math DNA: Differences, Nth Terms, and Algebraic Sequences

Guide for Curriculum Unit 17.05.11, published September 2017
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A sequence is an ordered list of numbers. Sequences can arise from visual patterns, recursive equations, explicit equations, and graphically. At the high school level, students work with arithmetic (linear) sequences, geometric (exponential) sequences, and quadratic sequences, as well as other types of sequences. With each type of sequence, students are expected to identify key features in order to write an equation that models the number pattern. Many students struggle significantly with writing an equation for a sequence, even when given the general formulas. This unit emphasizes the difference sequence and initial terms of an original sequence to determine a general equation for particular classes of sequences. Also, structures of difference tables, second difference tables, and ratio tables are introduced as tools to assist students with analyzing sequences in order to connect the numerical patterns with their algebraic representations.

(Developed for Mathematics Analysis, Pre-Calculus, grades 10-12, and Mathematics 1, grades 9-12; recommended for Algebra 1 and Integrated Mathematics 1 and 2, grades 8-12, Mathematics Analysis/Pre-Calculus, grades 10-12, and Algebra 2, grades 9-12)