



# YALE NATIONAL INITIATIVE

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Curriculum Units by Fellows of the National Initiative  
2018 Volume IV: Big Numbers, Small Numbers

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## **Enumerating Daily Life with Counting Principles, Permutations, and Combinations**

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by Lawrence E. Yee

Counting allows us to quantify our world. The Fundamental Counting Principle is introduced in elementary and middle school as a way to find the number of outcomes in a situation. In high school, permutations and combinations are emphasized in Integrated Math II (or Algebra II) and then further explored in Math Analysis (pre-calculus) courses and Advanced Placement Statistics. The connections between these three topics are often not clearly explained or emphasized, though the structures and formulas for computation are similar. This unit highlights the relationships between these mathematical concepts through examples and generalizes the structures to derive the general formulas and properties. This unit is written for students taking Math Analysis, but the problems and ideas can be adapted and modified for other math courses and grade levels.

(Developed for Math Analysis, grades 10-12, and AP Statistics, grades 11-12; recommended for Algebra 2, Integrated Mathematics 2, and Math Analysis, grades 9-12, and Mathematics, grade 7)

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