1096-11-1220 **Jennifer L. Lansing*** (jlweber@illinois.edu). *On the Stern sequence and a related sequence.*

The author gives an introduction to the Stern sequence, some new results for the Stern sequence, and introduces a related sequence and some of its properties.

In 1858, Stern investigated a sequence of numbers, which he called the diatomic array, constructed in a way similar to Pascal's triangle: take two values a and b which form the first row, and form the next row by rewriting the previous row and inserting the sum $a + b$ between its summands. The Stern sequence is also defined by the recurrences $s(2n) = s(n)$, $s(2n+1) = s(n+1)+s(n)$ with $s(0) = 0$ and $s(1) = 1$. The diatomic array has many properties: the sum of values in a row is a power of 3, the largest value in a row is a Fibonacci number, every third term is even, and every number m will appear at most $\phi(m)$ times in a row. We give new results regarding the second and third distinct largest values in a row of the Stern sequence. We also discuss properties of a related sequence, defined as $w(n) := \frac{1}{2}s(3n)$. The sequence $w(n)$ inherits many similar properties to the Stern sequence, yet is more complicated in structure. This sequence has recurrence relations independent of $s(n)$, symmetry among values, and largest values related to Fibonacci numbers. (Received September 13, 2013)