1077-VJ-845 **Michael A Brilleslyper*** (mike.brilleslyper@usafa.edu) and **Bradley A Warner** (brad.warner@usafa.edu). *How Fast does a Sequence of Positive Integers Grow? An Elementary Perspective based on Multiplication.* Preliminary report.

Let $a_1, a_2, \ldots, a_j, \ldots$ be an increasing, infinite sequence of positive integers. For example, we may have $a_j = j$, or $a_j = 2^j$. Other examples include the even or odd integers, or the sequence of prime numbers. We are interested in how such sequences grow relative to the notion of how rapidly the product of consecutive terms grows. In particular, we define the following terms: For a given sequence $\{a_j\}$, we let

$$P^{(n)} = \prod_{j=1}^{n} a_j.$$

Then, for each value of n, there exists a unique integer $k \geq 0$, such that the product

$$Q^{(k)} = \prod_{j=n+1}^{n+k} a_j$$

satisfies the following properties: $P^{(n)} \geq Q^{(k)}$ and $P^{(n)} < Q^{(k+1)}$. Thus k is a funtion of n that we denote by $k = f(n)$. This talk will outline properties of f for various integer sequences and also consider the existence of sequences that result in f having particular characteristics. (Received September 13, 2011)