1046-11-980 **Helen G. Grundman*** (grundman@brynmawr.edu), Department of Mathematics, Bryn Mawr College, 101 N. Merion Ave., Bryn Mawr, PA 19010. *Happy Numbers and Semihappy Numbers.*

Let $\mathbf{e} = (e_0, e_1, \dots)$ be a sequence with $e_0 = 2$ and $e_i \in \{1, 2\}$ for $i > 0$. Let $S_{\mathbf{e}} : \mathbf{Z}^+ \to \mathbf{Z}^+$ be defined by

$$S_{\mathbf{e}}\left(\sum_{i=0}^{n} a_i 10^i\right) = \sum_{i=0}^{n} a_i^{e_i}.$$

An $\mathbf{e}$-*semihappy number* is a positive integer a such that for some $k \in \mathbf{Z}^+$,

$$S_{\mathbf{e}}^k(a) = 1.$$

Recall that a *happy number* is the special case of an $\mathbf{e}$-semihappy number with $\mathbf{e} = (2, 2, 2, \dots)$. We say that a positive integer is a *semihappy number* if it is an $\mathbf{e}$-semihappy number for some $\mathbf{e}$, as above.

After introducing these concepts, we will summarize a variety of results, and indicate methods of proof, concerning fixed points and cycles of $S_{\mathbf{e}}$, heights and global heights of $\mathbf{e}$-semihappy numbers, and lengths of sequences of consecutive $\mathbf{e}$-semihappy numbers. (Received September 13, 2008)