1. Consider the following take-away game: There is a pile of $n$ chips. A move consists of removing $5^k$ chips for some $k \geq 0$. Compute the Sprague-Grundy numbers $g(n)$ for $n \geq 0$.

2. In a take-away game, the set $S$ of the possible numbers of chips to remove is finite. Show that the Sprague-Grundy numbers satisfy $g(n) \leq |S|$ where $n$ is the number of chips remaining.

3. In a take-away game, the set $S$ of the possible numbers of chips to remove is the complement in \{1, 2, 3, \ldots, \} of a finite set. Show that $g(n) \to \infty$ with $n$. 